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Vol. 17, No. 3 March 1998

Cover Story

Safe SHOALS

By Robert Wyman

You won't dash your boat against these SHOALS! On the contrary, this acronym stands for an on-going, high-tech mapping project that is improving the safety of coastal areas nationwide. The project is a joint venture of public and private sector organizations, and its end users are equally diverse.

What makes this project so fascinating is the technology that has revolutionized traditional mapping techniques. In years gone by, a helicopter running a methodical search pattern could be assumed to be hunting for something ... or someone. Not so today. Watch for this unique team hovering over a waterway near you!

Cover photo: NOAA's modified Bell 212 helicopter, photographed by Robert Wyman.

CONTENTS

MONITORING TIMES (ISSN: 0889-5341) is published monthly by Grove Enterprises, Inc., Brasstown, North Carolina, USA.

Address: P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902-0098
Telephone: (704) 837-9200
Fax: (704) 837-2216 (24 hours)
Internet Address: *www.grove.net* (web) or *mt@grove.net* (e-mail)
Editorial e-mail: *mteditor@grove.net*
Subscriptions: *order@grove.net*

Subscription Rates: $23.95 in US; $36.50 Canada; and $55.45 foreign elsewhere, US funds. Label indicates last issue of subscription. ***See page 95 for subscription information.***

Postmaster:
Send address changes to *Monitoring Times*, P.O. Box 98, Brasstown, NC 28902-0098.

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WASHINGTON WHISPERS

By Fred Maia, W5YI
fmaia@internetMCI.com

• **Vermont does not want to be an "antenna pincushion."** To speed the roll-out of digital television, the FCC seeks to preempt tower construction. As a result of a joint petition by National Association of Broadcasters (NAB) and the Association for Maximum Service Television, on August 19, 1997, the FCC issued a rulemaking (Mass Media Docket. No. 97-182) that would preempt local zoning authority over broadcast (but not amateur radio) towers.

Formal comments closed on October 30, replies on December 1. The NPRM limits State and local zoning officials from having authority over the siting and construction of broadcast towers as the shift to digital television (DTV) occurs. The FCC said that local zoning and land use ordinances could present an obstacle to the rapid implementation of digital television service.

The petitioners wanted the preemption to include all types of broadcast antennas and towers — not just those necessitated by the switch to DTV. (Some AM/FM station antennas are co-located on TV towers.)

The FCC noted that historically they have tried not to become unnecessarily involved in local zoning disputes regarding tower placement. "Nevertheless, we have adopted rules preempting local zoning ordinances where the record established that such ordinances were inhibiting the implementation of Congressional or FCC objectives, including with regard to locating satellite 'dish' antennas and amateur radio towers (Federal Preemption of State and Local Regulations Pertaining to Amateur Radio Facilities, PRB-1 50 Fed. Reg. 38813 - September 25, 1985)."

At the same time, the FCC said it "...was sensitive to the rights of states and localities to protect the legitimate interests of their citizens and we do not seek to un necessarily infringe these rights."

Senator Patrick Leahy (D-Vermont) strongly objected to the proposed FCC rules which would permit the placement of commercial telecommunications, radio or television towers near homes, residential communities and in scenic areas.

"The bill also prohibits towns and cities from having stricter health and safety standards regarding environmental effects of radio frequency emissions," he said.

Senator Leahy has now introduced ***Senate Bill 1350*** that repeals the 1996 Telecom bill authority given to the FCC to preempt State and local regulations on the placement of new telecommunications towers.

"I don't want Vermont turned into a giant pin cushion with 200 foot towers indiscriminately sprouting up on every mountain and in every valley, ruining the view that most of us have spent a lifetime enjoying."

• **Are you aware that you can file comments on all FCC proceedings by e-mail?** Instructions on how to do it are located on the FCC's website at: **http://www.fcc.gov/e-file/email.html** Basically you just call up a blank form and fill in the blanks. You e-mail the form to the FCC at *ecfs@fcc.gov* after saving it as an ASCII file. The FCC's computer will acknowledge receipt.

• **Both citizens band and ham radio communications suffer from a lack of FCC enforcement of the radio rules.** Actually there is little the FCC can do since, in a cost cutting move, the Government drastically cut back on their local presence. All complaints are now handled by the FCC through a centralized toll free number and almost all of FCC's local field offices have been closed or consolidated.

Two different approaches are now being suggested to deal with the enforcement problem. U.S. Senator Russell Feingold (D-Wisconsin) wants to give states and municipalities authority to enforce the FCC's CB regulations.

Feingold's bill, designated ***Senate Bill 608***, began as an ordinance passed by the Beloit, Wisconsin, City Council. That statute allows local authorities to enforce FCC regulations. The bill is aimed at reducing radio frequency interference stemming from the use of unauthorized equipment or frequencies between 24 and 35 megahertz by CBers.

If approved by Congress, Feingold's bill would amend the Communications Act to allow state or local governments to enforce regulations that prohibit the use of CB equipment not authorized by the FCC ...such as high-power linear amplifiers. As it now stands, no license is required to operate on the 11-meter Citizens Band, but the FCC does have strict requirements on the type of equipment that CBers can legally use.

Feingold's bill would preserve the federal preemption of all other telecommunications matters. It also excludes FCC-licensed services, including Amateur Radio, from state or local oversight. S.608 is currently under consideration by the Senate Commerce, Science and Transportation Committee.

A similar bill is moving through the House of Representatives. Rep. Vern Ehlers (R-Michigan, and who holds a Ph.D in nuclear physics) introduced ***H.R. 2612*** which is now being considered by the House Subcommittee on Telecommunications.

At the request of the American Radio Relay League, the bill calls upon the FCC to provide "technical guidance" to states and local governments in detecting and determining violations. Those affected by a state or local enforcement decision would be able to appeal to the FCC within 30 days.

Neither bill would preclude the FCC from enforcing its own regulations as they apply to CB. Feingold calls his bill "...a common-sense solution to a very frustrating and real problem which cannot be addressed under existing law."

• **The American Radio Relay League is suggesting a different "self enforcement " approach to the lack of FCC radio enforcement.** The ARRL wants the FCC to "...create a streamlined, privatized enforcement process" to handle and prosecute the most serious Amateur Service interference violations.

The League has petitioned the Commission to amend its rules to permit members of the volunteer Amateur Auxiliary to bring evidence of malicious interference violations directly before the FCC's legal department. The Amateur Auxiliary is a volunteer group authorized by the FCC to monitor the ham bands. Currently, all enforcement cases are administratively handled internally by FCC lawyers — a time consuming and costly operation. The FCC's Chief Administrative Law Judge would be authorized to determine if a valid case exists, and if so, to issue show-cause orders, and to designate complaints for hearing.

The League recommended that the FCC capitalize on the volunteer resources available through the Amateur Auxiliary to relieve the evidence-gathering burden in such cases. If the rules changes are approved, the League said it would assist the Auxiliary in preparing and submitting complaints and in presenting cases at administrative hearings.

"The increased use of volunteer resources would seem to be entirely appropriate in the Amateur Service, which involves avocational use of radio only," the ARRL concluded. "Malicious interference problems, if left unchecked, tend to spread and increase in intensity."

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SOS for Morse Code

On January 1, 1998, many coastal stations worldwide abandoned 89 years of monitoring for Morse code distress signals on 500 kHz (see *Utility World*). But no one expected it to be marked by an SOS on December 31st.

Stonehaven Radio, near Aberdeen, Scotland, received the initial signal at 10 a.m. from the *m/v Oak*, a 13,000-ton vessel en route from Canada to Liverpool. According to reporter Paul Whittaker, the *Oak* was 790 miles west of Ireland when its cargo of wood shifted in storm-force winds and it lost all engine power.

When Stonehaven Radio passed the message to the Falmouth Coast Guard, they initially wondered if it was a joke. One spokesman said, "We haven't had a Morse distress message for years. It was almost too perfect. But we knew straight away someone was in distress as nobody ever sends an SOS signal as an exercise." Subsequent communication with the ship was conducted via satellite.

We don't know the outcome of this dramatic story. As night fell and an RAF Nimrod circled the ship, the nearest ship was still 500 miles away and the *Oak* was far out of the range of land-based rescue helicopters. As the master and crew of 26 prepared to abandon the *Oak*, he sent this last optimistic message: "Happy New Year. Best regards. Master."

WZLS Six, FCC One

Zebulon Lee, the 86-year old owner of WZLS-FM in Asheville, North Carolina, has been fighting for the right to operate on 96.5 MHz since 1987. He was originally granted an interim permit, which was then contested by five non-local applicants. His permit was challenged but upheld five times. In 1993 he decided to build the station and signed on as Asheville's only local rock station.

In 1994 the other applicants appealed again, and this time the FCC overturned its previous ruling, saying that a 1993 federal court decision had overturned the FCC's policy of encouraging non-absentee owners. Opponent WZRQ-96.5 was on the air by June 1997.

WZLS, feeling it had the valid license, also continued to transmit until threatened with a $20,000 fine by the FCC.

This past December, in an unusually quick decision, a U.S. appeals court returned the frequency to WZLS, telling the commission that it "abused its discretion and acted arbitrarily and capriciously."

The FCC is considering revamping its licensing rules.

Driving Distraction No. 1

There are certain sounds that seem to cause an almost involuntary response: the sound of your baby crying in the night, the sound of change falling on the floor ... I can't stop myself from looking at the phone even though my head tells me that ring I just heard was on the TV show.

Such reflex reactions must be the incen-

BULLETIN BOARD

March 1: Zephyrhills, FL

Phinney Fest held by Zephyrhills ARC at the Zephyrhills Lions Club, 5827 Dean Dairy Road, 8a.m. to 2p.m. Admission $4. Talk-in 147.135. Drawings, prizes, food, fleamarket. Write Zaarc, P.O. Box 1534, Zephyrhills, FL 33539, call Ernie KD4VRV 813-783-8389 or email *ernamae@zhills.net*

March 11: Stamford, CT

The Stamford Amateur Radio Association Novice/Tech course starts Wednesday, March 11th, 1998 for ten sessions 7-9 p.m. each Wednesday. Pre-registration required; contact Jim Murdock 203-322-4707, Richard Finn 203-323-0982 or Andrew Laska 203-531-9493 or via internet *ka1slg@qsl.net*. No charge except materials.

March 21-22: Bethpage, NY

The Long Island Mobile Amateur Radio Club (LIMARC) Weekend Ham Radio Course at Briarcliffe College, 1055 Stewart Ave, Bethpage, NY 11714. Obtain your entry level Technician class license in one weekend course. Cost $35 includes workbook, lunch and refreshments. Preregistration required. Contact LIMARC Weekend Class, P.O. Box 392, Levittown, New York 11756 or e-mail George Tranos, N2GA at *N2GA@aol.com*.

March 14: Denver, CO

The Denver Radio League announces its First Annual C-Rock 'Fest at the Douglas County Fairgrounds, Castle Rock, CO, 8a.m. to 1p.m. Talk-in 146.88. Adm: $4. Swap tables, VE testing, prizes, special event station. Contact Al Cooley, 6199 South Broadway, Littleton, Colorado 80121, 303-777-2428. *ALN0AUS@aol.com*

March 14, 21, 28, Apr 4: St. Louis Co., MO

Annual St. Louis County Skywarn Weather Observation Training Seminars at various locations. Level 1 in a.m., Level 2 in p.m. For locations call 314-889-2857 for taped message. Outside area attenders welcome; no advance registration required. Certification provided for RACES and SKYWARN at no cost. Need not be a ham to participate.

March 22: Madison, OH

Lake County ARA (LCARA) 20th annual hamfest at Madison High School on North Ridge Road, 8a.m. to 2p.m. Admission $5. New and used equipment, prizes, forums, test bench, license exams. Contact Len Sechrist WS8O, 8550 Nowlen St, Mentor, OH 44060, 440-255-0112.

March 22: Yonkers, NY

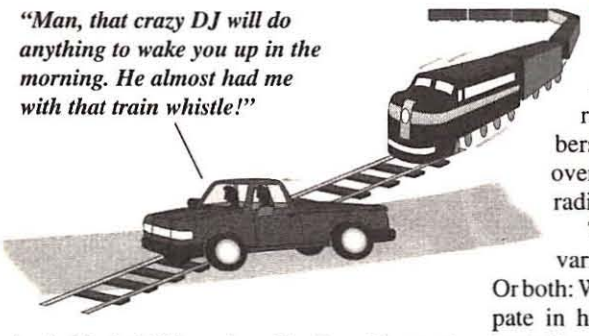
Westchester Emergency Communications Assoc (WECA) annual electronics and hamfest at Yonkers Raceway, 8a.m. to 2p.m. Talk-in 147.060 (+6, PL 114.8). Admission $6. New and used equipment, prizes, license exams, forums, radio clinic. Call 914-741-6606 or visit **www.wec.org**.

March 29: Southington, CT

Southington ARA (SARA) annual fleamarket at Southington High School on Pleasant St, 9a.m. to 1p.m. Talk-in 147.345, 224.80, 444.25, 145.49 PL/77Hz. Admission $4. Vendors, prizes, license exams. Contact Chet KA1ILH 860-628-9346 or SARA, PO Box 873, Southington, CT 06489.

Club News:

- Assoc of North American Radio Clubs (ANARC) chairman Mark Meece e-mail address is *mmeece@siscom.net*
- Boston Area DXers covers 0-30 MHz. See web site at **www.grove.net/~badx/** or contact Paul Graveline, 9 Stirling St., Andover, MA 01810-1408.
- Capitol Hill Monitors has a web site: **www.grove.net/~chm**
- Southern California Monitoring Association meets once a month, 2nd Wednesdays 7p.m. at Acapulco Restaurant, 3360 Ocean Park Blvd, Santa Monica, CA. For more info contact SCMA, PO Box 3031, Culver City, CA 90231 or **w6trw.sp.trw.com/scma/scma.htm**



tive behind a bill introduced by Rep. Vento of Minnesota. H.R. 369 would require the FCC to prohibit radio stations from using sound effects similar to those used as a warning by public safety or other traffic, such as horns, sirens, or train whistles. The Bill says "motor vehicle operators, when distracted, can pose a safety risk to others on the roads."

Driving Distraction No. 2

There's a new program in driver's ed these days that many grown-ups need to take. It's called "Safetalk." Participants in the exercise may be asked to dial a cellular phone number while driving through an obstacle course. Most students find (to their surprise) they can't do it.

Although the *New England Journal of Medicine* found that a cell phone user is four times more likely to get into a crash as a typical driver (equivalent to driving drunk), responders to a *Glamour* magazine survey remarked, "How are cell phones any more hazardous than CBs in the trucks or screaming kids in your backseat?"

FCC Seal of Approval

The around fifty percent of cellphone owners who purchased the phone to use just for emergencies got some good news from the FCC. In a recent Reconsideration Order the FCC upheld the requirement that 911 service must be made available to users of telephones that have not been activated by any carrier.

The commission said many wireless 911 calls are made by Good Samaritans, and that "making it easy for these messages to be delivered to public safety organizations thus benefits the public at large." It requires wireless carriers to transmit "all 911 wireless calls without regard to validation procedures intended to identify and intercept calls from non-subscribers."

Just be sure to pull over to the side of the road before making that emergency call.

Radio Clubs Decline

The Association of North American Radio Clubs (ANARC) reported a 12 percent drop in membership within its 17 member clubs over the past year. Every club across the radio spectrum lost membership.

The causes for the drop are no doubt varied, from economics to the Internet. Or both: Without paying dues one can participate in hobby news groups such as those hosted by the Grove internet server and achieve much more immediate communication. It begs the question, will the clubs be able to meet the challenge of evolving along with the radio hobby they have helped to define? We're betting many of them will.

Radio Waves: Kill ya or Cure ya?

An experimental medical device called the Prostatron uses microwaves at 1296 MHz in its treatment of prostate cancer. This frequency is in the 1240-1300 MHz band used by air traffic control and, on a secondary basis, by amateur radio operators. The unit has received approval by the Food and Drug Administration, but its request for a waiver from the FCC has so far not been granted.

The ARRL has objected to granting of the waiver on the grounds of the potential for interference as well as the fact that there is a band already set aside for medical devices. Meanwhile, the ARRL argues that the device is already being used for treatment without the waiver being granted. The FCC has opened a new public comment period on the matter.

On a higher plane (in physical location, not in frequency), residents in a number of New York boroughs outside Manhattan are unhappy about a deal to outfit as many as 9,000 lamposts with cellular antennas. Three telecommunications companies are interested in leasing the posts (for a monthly rental fee of about $100 per post) to improve the problem of dropped calls and to pave the way for digital wireless networks. However, residents are concerned about the potential health risk.

Prohibited from using the 1296 MHz microwave frequency for prostate cancer treatment, medical researchers experiment with AM/FM radio implants.

"The company claims they're safe when properly installed," said James Crisafulli, of Community Board 7 in Northeastern Queens, "but not a single city agency is going to be checking the installation of these things or is capable or qualified to do that."

We welcome news clippings from your world of radio. Send to editor Rachel Baughn at *MT* headquarters, or email to *mteditor@grove.net*

Thanks to this month's reporting team: Anonymous, NY; David Alpert, NJ; Shawn Axelrod, Can; Ernie Blair, AL; Glenn Blum, TX; John Brugliera, VT; David Chapchuk, PA; Leslie Edwards, PA; P. Goodwin, MA; Wm. Hearty, OH; Maryanne Kehoe, GA; Kevin Klein, WI; Jim MacDonald, NH; Bob Mills, OH; D. Parsons, AZ; Doug Robertson, CA; Richard Schultz, KY; Richard Sklar, WA; Larry Van Horn, NC; *Dispatch Bulletin*; *W5YI Report*

Safe SHOALS

Mapping project enhances coastal safety

Photos and Story
by Robert Wyman

NOAA's Bell 212 helicopter is modified to accommodate the pod containing LIDAR and video equipment (shown under the fuselage).

Traveling 700 feet over the bay at fifty knots, the bright blue and white Bell 212 helicopter gets the attention of nearby beachgoers and marina workers. It follows a search-pattern course that lead some to believe the police are looking for something ... or someone ... in the busy waterway. The helicopter remains offshore for over an hour, methodically covering everything from the coastline to the deepest part of the channel. Unseen or ignored in the marina parking lot, a technician in an unmarked van also watches the helicopter ... knowing that police aircraft are nowhere in the area.

Several miles away at a local general-aviation airport, a tractor-trailer rig sits next to a hangar supplying "shore power" for air conditioning, computers and telephone systems. Technicians inside the trailer await the arrival of data tapes from the flight so their work can finally begin.

Back at the marina, the aircraft begins a final run for the day. The technician in the van begins to wrap up cables and organize paperwork, awaiting word to cease transmitting differential GPS[1] data to the helicopter. When advised, the technician will stow the portable antennas and radios used to receive the satellite differential signal for rebroadcast to the helicopter, while a handheld radio remains available for air-ground communications.

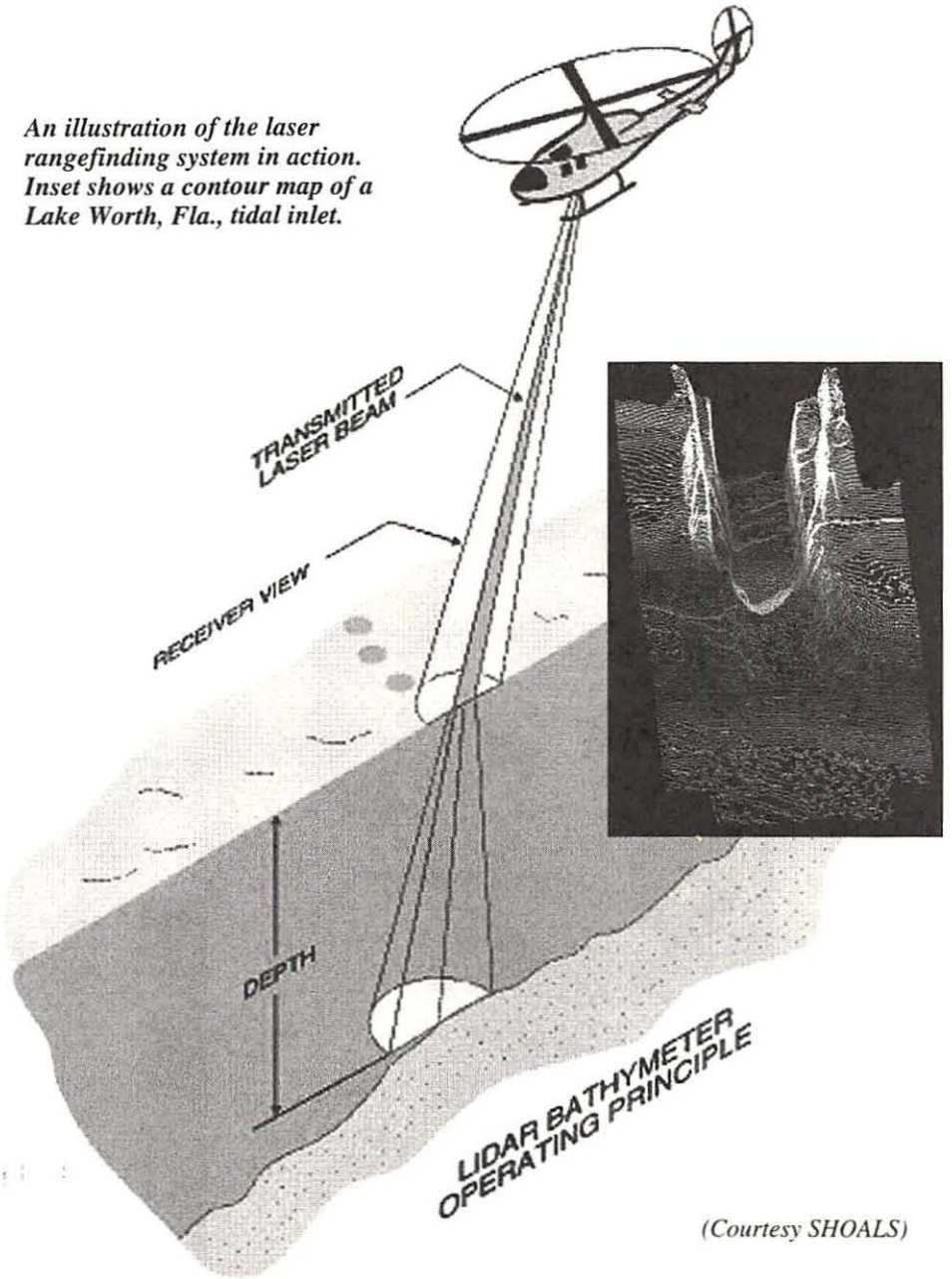
Welcome to SHOALS, the latest high-tech effort in coastal management.

As with many modern projects, technological advances equate to politically-correct names and complex abbreviations, and this project certainly has its share:

SHOALS is the Scanning Hydrographic Operational Airborne LIDAR Survey, and it's coming to a seashore, bay or lake near you soon. In 1997, it completed surveys of 75 locations around the Great Lakes, North Atlantic states, and Florida.

LIDAR is Light Detection and Ranging, a system of laser rangefinding tuned for water surface and subsurface observations.

In addition, ALBTCX, the Airborne LIDAR Bathymetry Technical Center of Expertise (in Mobile, Alabama), serves as the clearing house for SHOALS project management and data analysis.



An illustration of the laser rangefinding system in action. Inset shows a contour map of a Lake Worth, Fla., tidal inlet.

(Courtesy SHOALS)

Background

SHOALS was conceived in 1985 as a mechanism to support the federal government's waterway survey program. These hydrographic surveys, conducted by the U.S. Army Corps of Engineers, encompass 25,000 miles of federally-maintained navigational channels with an annual cost of over $40 million dollars.

Utilizing the Army Engineers' fleet of 50 small vessels and an array of contractor ships, the survey assignments support maritime construction projects, nautical charting, flood control, environmental monitoring, and storm damage assessment. In extremely shallow water, or channels littered with submerged debris from storms, surveys are often incomplete or dangerous.

By 1988, a joint U.S./Canadian development program began to design, construct and field test an airborne LIDAR system to supplement surface-based data collection efforts. LIDAR is a spinoff from military anti-submarine warfare programs of the 1960's, in which lasers were tested in a submarine detection role. Throughout the 1970's, LIDAR attracted the interest of university researchers, Navy and NASA scientists, as well as private and government oceanographic agencies worldwide. Second-generation LIDAR systems, with optical and electronic enhancements, fueled continued research in the 1980's.

A field-ready system was completed in November of 1993 and validation tests, flown over the New Pass federal navigational project in Sarasota, Florida, were completed in January and February of 1994. SHOALS equipment was accepted in the spring of 1994 and over 125 deployments occurred in the subsequent 24 months. During this two-year mission calendar, over 2,250 square kilometers were surveyed, generating over 275 million measurements.

Management

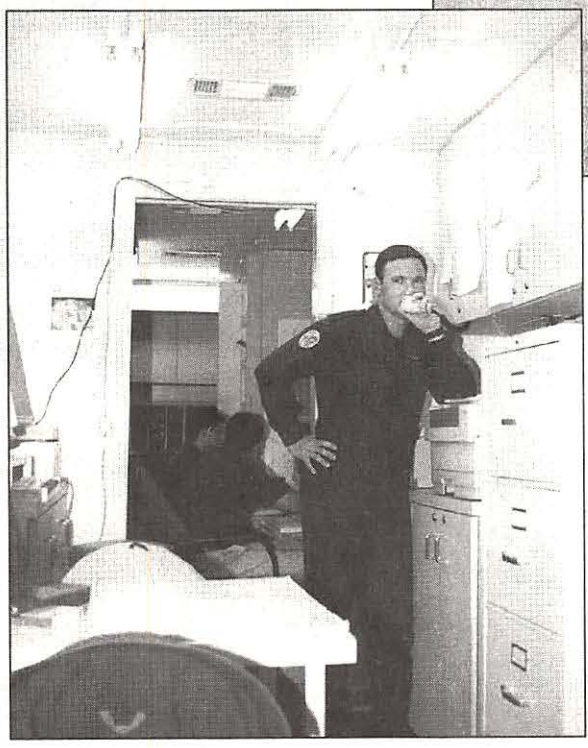
The SHOALS program is now in its fourth fiscal year of operational deployments. A model for joint public-private enterprises, management is handled by the Army Engineers' Waterways Experiment Station (Vicksburg, MS) which also coordinates government survey clients. Operation, maintenance and coordination of private survey clients is the responsibility of John E. Chance and Associates, Inc. (Lafayette, LA), a contractor specializing in advanced surveying applications.

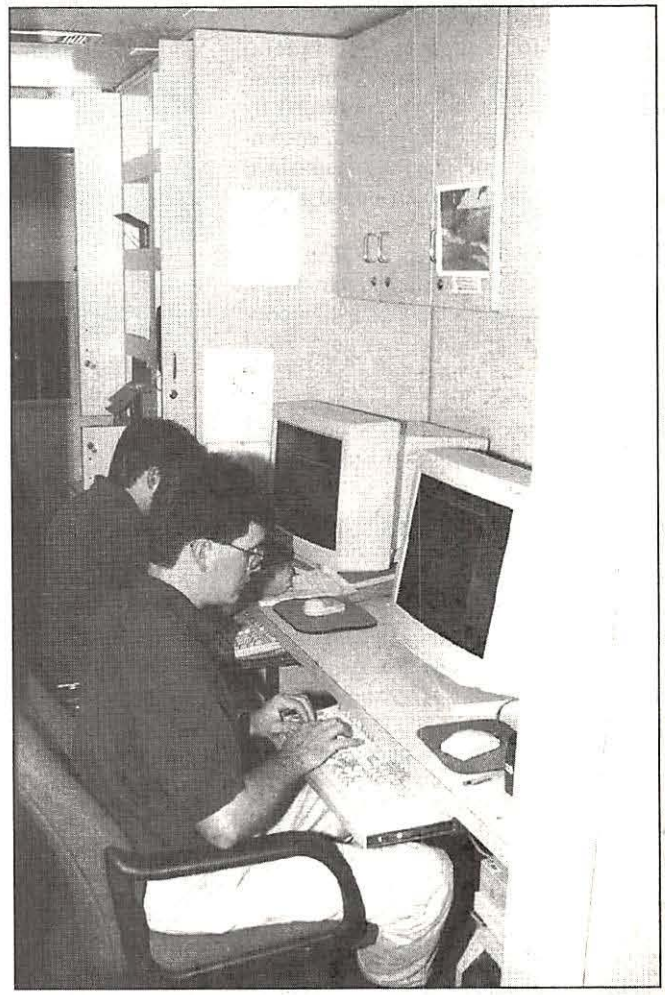
Hardware development is credited to Optech, Inc. (Toronto, Canada) and software comes from the National Oceanographic and Atmospheric Administration (NOAA) / National Ocean Service. Helicopters and pilots are supplied by NOAA's Aircraft Operation Center at MacDill AFB, Florida.

The airborne system, in addition to providing a survey mechanism for shallow or dangerous waters, is also over ten times faster than shipboard echo sounders. During a two-

The truck trailer houses a supercomputing workstation to begin processing the raw data. Army Engineers Eddie Wiggins and J.D. Balch process the day's accumulated information at the mobile data center.

Immediately below: Craig Branson is the LIDAR Specialist from John E. Chance & Assoc. His operating position is at the impressive equipment rack in the rear of the helicopter (pictured at bottom).





year statistical period, for example, 180 million measurements were logged — a volume that would take 24 years with older acoustic sounders. In one hour, SHOALS can map approximately eight square kilometers or a 100-meter wide channel up to 80 kilometers long, with 115,000 measurements per kilometer!

■ Flight Operations

Typical deployments include one helicopter (of two available), the mobile office and other crew/support vehicles. SHOALS managers, technical staff, two data processing engineers, one or two airborne system operators, two pilots, and a mechanic comprise the personnel roster.

Initial site planning and equipment setup is completed in less than a day, making for a highly mobile system; for larger coastal survey areas, a central airport is chosen as a base of operations and flights are made over several days. Flight time includes 2-3 flights per day of about two hours each, with about 600-800 hours per year. Pre-flight work involves a review of the survey area and establishment of "flight lines" used for precise navigation.

NOAA's Bell 212 helicopters are modified with extended landing struts and an equipment pod containing LIDAR and video hardware. Green and Infrared lasers are used, directed by a gyrostabilized (optical) scanner linked to an inertial reference system that compensates for aircraft motions.

Using mathematically-coordinated hardware and software, variables such as aircraft speed and attitude, aircraft GPS coordinates (differential GPS), flight line position, laser power, water surface wave heights, water density, clarity and subsurface attributes are recorded.

Laser pulses or "soundings" (a term originating with the older acoustic measurement system) are made up to 200 times per second, resulting in accurate depth measurements over a uniform four square meter grid. Published vertical accuracy is plus or minus fifteen centimeters, with horizontal accuracy at plus or minus three meters. Data points and supplemental information are recorded on dual 8mm tape drives with a rate of 300kb per second.

Within the trailer, a Sun-4/SPARC 10 Supercomputing Workstation with 160Mb of memory, 10Gb of disk space and an Exabyte 8500 tape drive are used for post-flight data

SHOALS

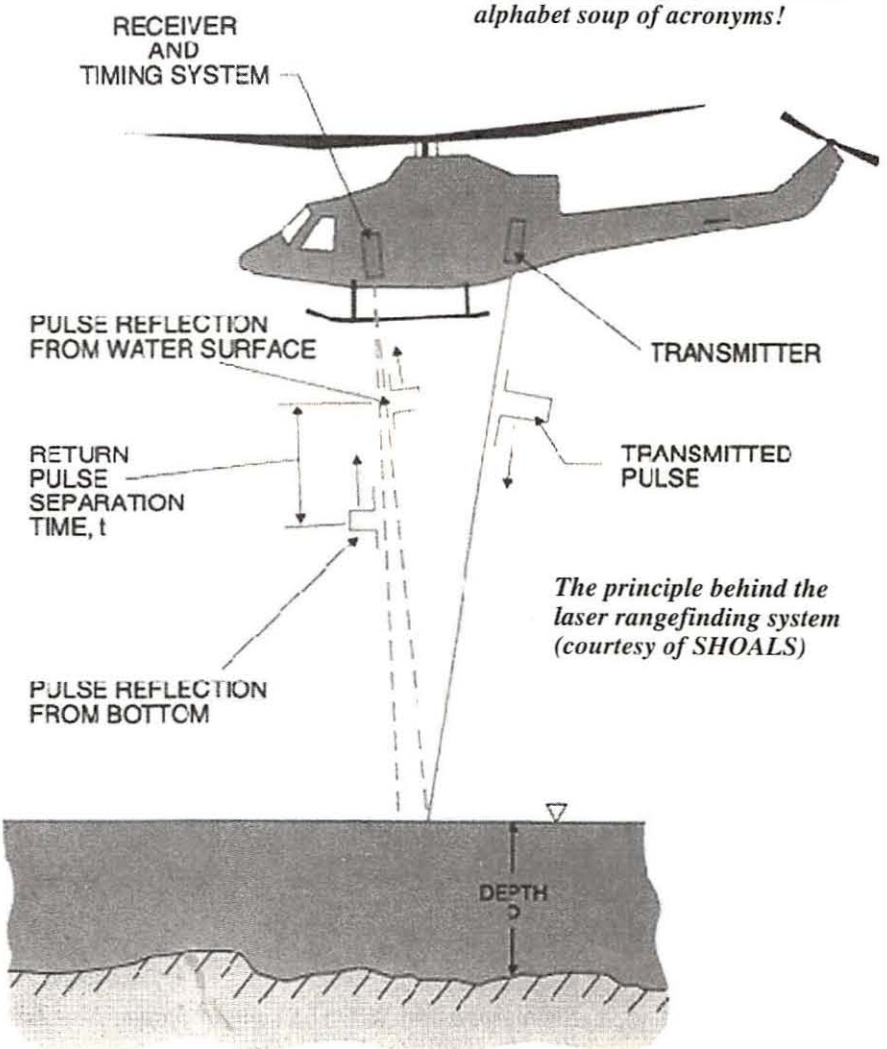
U.S. ARMY CORPS OF ENGINEERS MOBILE DISTRICT

JOHN E. CHANCE & ASSOCIATES, INC.

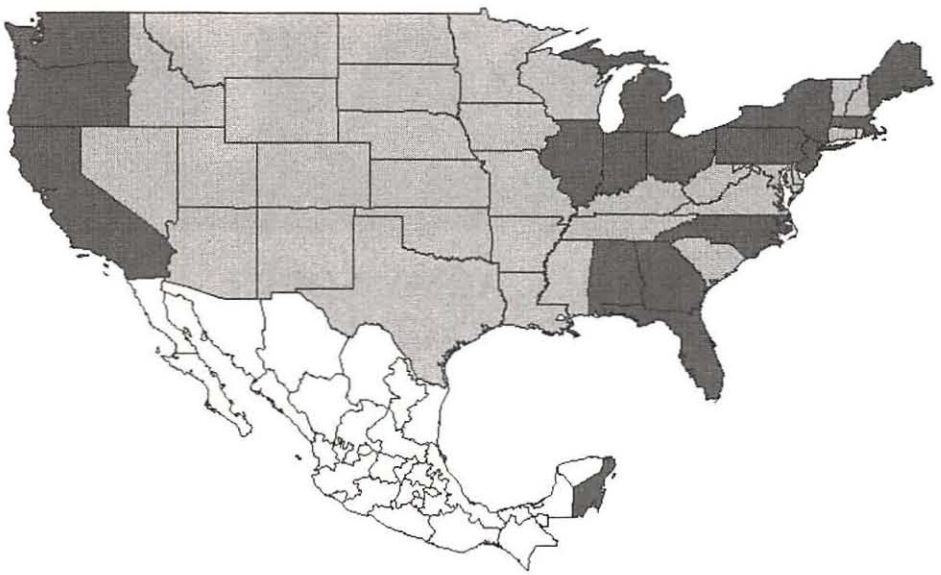
FUGRO

Optech Inc.

A model of public-private cooperation, the project is also an alphabet soup of acronyms!



The principle behind the laser rangefinding system (courtesy of SHOALS)



Clickable map on the SHOALS website gives specific information about projects underway or already completed. The darkened states or regions are the active sites.

processing. Additional computers are used for geographic data manipulations (contouring, mapping, etc.), mission planning and administration. Each hour of data collection requires an hour of data processing, keeping SHOALS staff busy on the ground as well as in the air. The "final product" of survey databases and two- and three-dimensional plots are written to CD-ROM.

Marketing

Although helicopters, mobile workstations and a highly specialized team are expensive, SHOALS has revolutionized coastal surveying by providing a product never before available, at any cost. This government-owned, contractor-operated program serves as a technology demonstrator for potential customers while fulfilling operational requirements of existing clients.

This "client based" method of marketing has been part of the SHOALS policy since its inception. Army Engineer projects give life to SHOALS, but equally-demanding Navy and National Ocean Service work broaden the system's exposure. State and local governments are also courted as end-users, especially for coastal zone management, environmental studies and emergency planning. In each case, customers are shown that SHOALS is cost-effective in terms of speed and accuracy at a level against which a shore-based survey party or vessel-based acoustic system just cannot compete.

Also important is the private-sector connection in SHOALS. Commercial LIDAR applications and private research are fully endorsed, with the expectation that additional work in this science will result in equipment improvements and cost reductions.

Future Endeavors

Plans for the experienced SHOALS team include the development of a Remotely Piloted Vehicle (RPV) for military applications. Harbor surveying, amphibious assault missions, and covert operations will benefit greatly from near real-time, accurate mapping of hostile coastlines.

"Sensor fusion" is also on the horizon, using computer-enhanced combinations of optical and electronic imaging to produce even more descriptive maps and charts.

So, the next time you look at a coastal map, hear about navigational channel maintenance on marine-band frequencies, or watch Emergency Management workers after a disaster, remember this unique team project. You can thank SHOALS for providing a high-technology, user-friendly, cost-effective data source that has improved the safety of our coastal waterways.

[1] Differential GPS is a data stream of corrected Global Positioning System (GPS) satellite information, used to provide extremely accurate location coordinates.

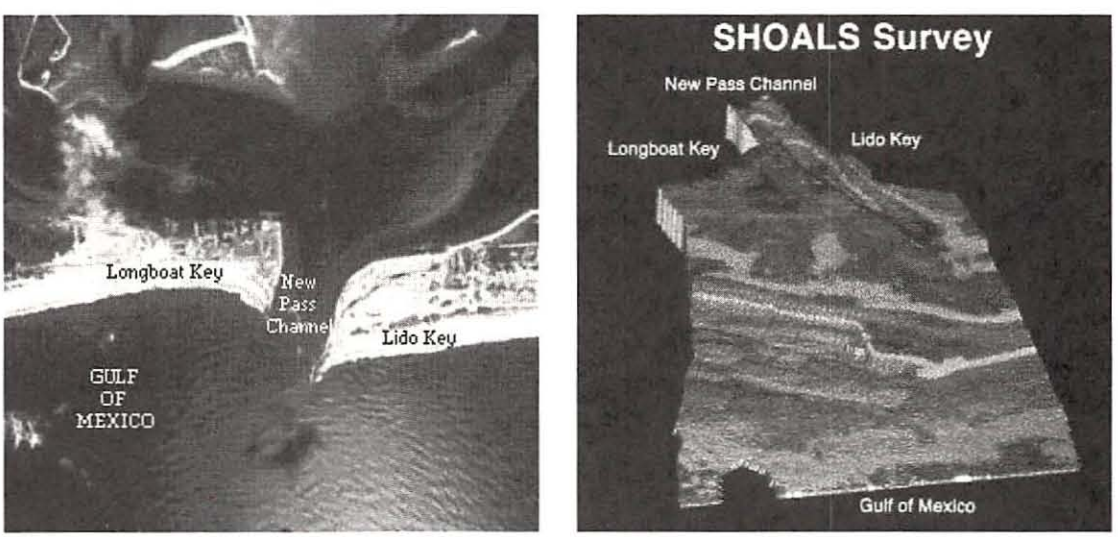
SHOALS Radio Frequencies

Primary air-ground:	164.075 MHz
Secondary air-ground:	164.025 MHz
Air traffic control:	(Local tower/approach freqs.)
Mobile office coord.:	(Cellular telephones)

Information Source
Jeff Lillycrop, Director, US Army Engineer Waterways Experiment Station

Additional Information and Graphics may be viewed at:

http://shoals.sam.usace.army.mil



Photograph and SHOALS contour map of New Pass Channel between Longboat and Lido Keys in Florida. (Courtesy SHOALS)

"Counter" Intelligence

Getting the Most Out of Your Frequency Counter

By Haskell Moore, KB5WIX

One of the favorite tools of the trade for any serious scanning enthusiast is the frequency counter. It can be the key to unlocking some of the most interesting and exciting scanning action as it unfolds. However, for those who don't understand the fundamentals of how a counter works, it can be an endless source of disappointment and frustration. In this article, we'll attempt to shed some light on the capabilities and limitations of frequency counters. And for those of you who've been using your counter for awhile, we'll include some tips to hopefully increase your success.

First, let's start with a short discussion of frequency counter fundamentals. Briefly stated, a frequency counter is an electronic device used to measure the frequency of a nearby transmitter. The counter will only acquire an accurate reading when the signal from source is relatively close by (referred to as "near field") and is approximately fifteen to twenty decibels stronger than the ambient signal level for a period long enough to acquire a reliable reading.

Some counters today employ one or more filter circuits to reduce false readings. The most elementary of these filters simply ensures that a consistent signal is present for a

Your frequency counter must be a dud, you think. You're standing right under the tower, but it still can't pick up the frequency! What gives?

sustained duration (approximately six milliseconds) before indicating a reading. More sophisticated filters, such as those found on the Optoelectronics Scout,* use a microprocessor which will almost eliminate false readings.

Another desirable feature to look for in a counter is an electronic memory to store the frequency readings it has obtained. Typically from one to three frequencies may be stored, then reviewed at a later time and entered into a scanner. Other counters, such as the Scout, can store up to four hundred frequencies, as well as the number of times a signal was received at each frequency. The Scout also offers an ICOM CI-V interface, which enables it to automatically tune a CI-V controlled scanner (such as the AOR 8000) to the same frequency that the Scout intercepts.

■ Understanding the Principle

To better understand how a frequency counter works, we'll try a simple analogy. Let's say that you're in a gymnasium with only one other person who is at the far opposite end of the gym from you. As this person begins to speak softly, you can hear the sound of their voice, but cannot discern what's being said.

Now let's assume that the person speaking represents the signal source (transmitter) and you represent the frequency counter. Just as you are unable to hear what is being spoken, the counter is unable to acquire the frequency of a signal that is too far away. In our gymnasium scenario, you would have to move close to the other person, or the other person would have to speak louder for you to understand what was being said.

Correspondingly, with a frequency counter attempting to receive a weak signal, the signal source would either have to increase its power or, more likely, you would have to move closer to the signal before you could obtain a reading.

■ Understanding the Problems

To understand another dilemma when using a frequency counter, let's again use our gym analogy. However, this time you're surrounded by a circle of people, all at an equal distance, and all talking at the same time at approximately the same volume. All you can make out is a jumble of voices, a low roar, but no single voice is discernible.

This is analogous to what happens when you try to use a frequency counter in an environment where you're surrounded by a number of strong signals. This condition, known as a high ambient noise floor, occurs when multiple transmitters in the same vicinity are all emitting signals at roughly the same level.

These two antenna covers hide antennas for 460 MHz communications and an 800 MHz mobile data terminal. But they didn't fool the frequency counter.

A typical example of what can occur is when an inexperienced counter user positions himself at the base of a radio tower with fifteen or twenty antennas clearly in view, yet he can't seem to get a single good reading.

On a typical day, there's a pretty high probability that many of the transmitters are active simultaneously. This is particularly true if one or more of those antennas are attached to a pager transmitter or cell phone transceiver, both of which transmit almost ceaselessly. All of these simultaneous signals create RF chaos that simply overloads the counter and renders it useless. The counter can't clearly discern one signal from the other, and therefore cannot provide an accurate reading from any single transmitter.

Again, for you to obtain an accurate reading, one single transmitter must be substantially stronger than the others. Unfortunately, since the antennas are all so close together, moving closer to the tower usually won't help. To further complicate matters, the base of an antenna tower is usually where the weakest emission of the signal is found.

This is the primary reason it is so difficult to obtain a good reading from a weak signal source in an urban environment saturated with high levels of radio frequency (RF) energy. One only has to look at the tops of the many buildings in the area to understand why. Within one thousand feet of my office in downtown Houston, Texas, are at least three hundred antennas, some transmitting at more than four hundred watts! Consequently, a frequency counter has very little chance of locking onto any single signal long

Some scanners can be automatically tuned by a sophisticated frequency counter.

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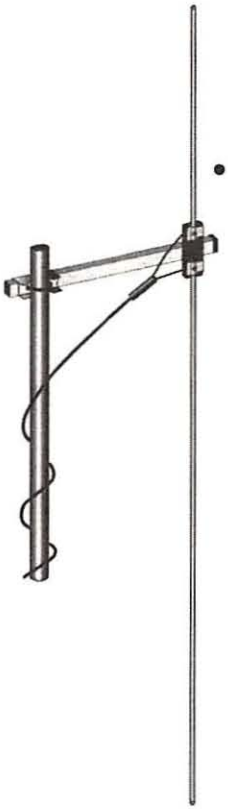

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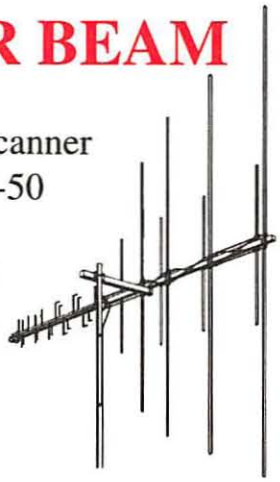

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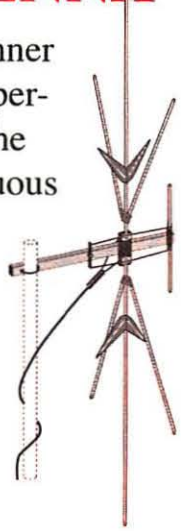

This omnidirectional scanner antenna will equal or outperform any competitor on the market, providing continuous frequency coverage from 25-1300 MHz.

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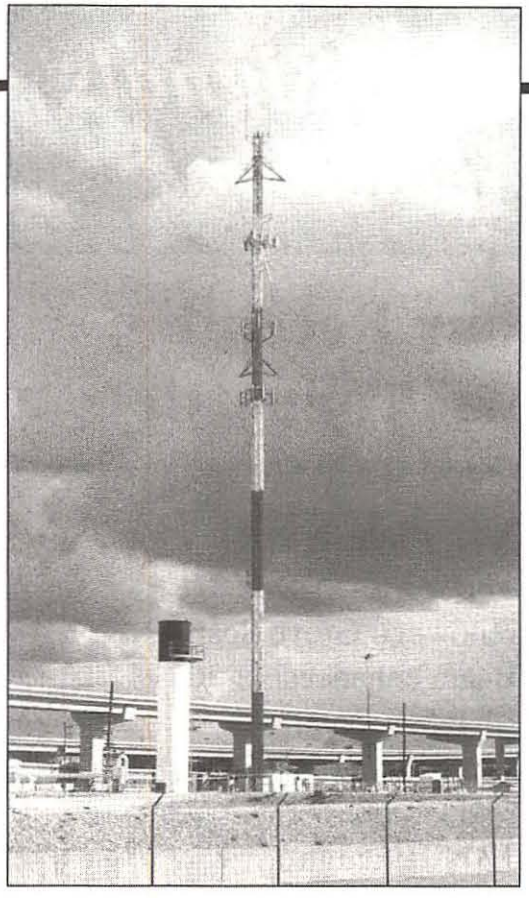
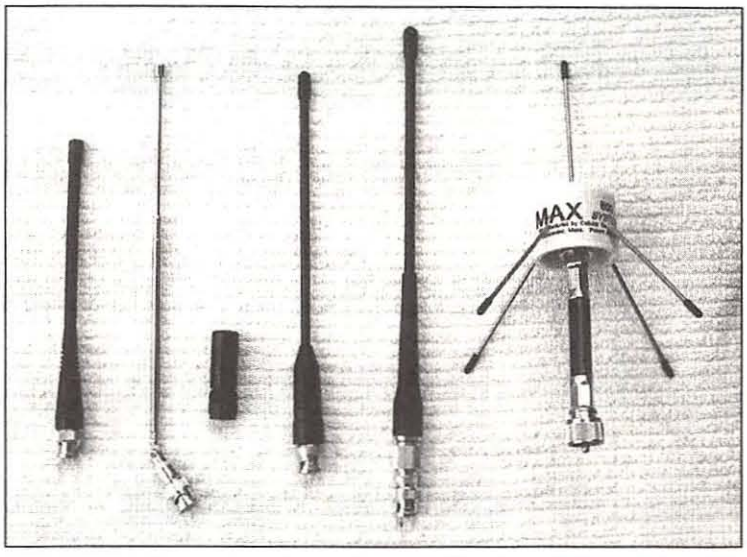


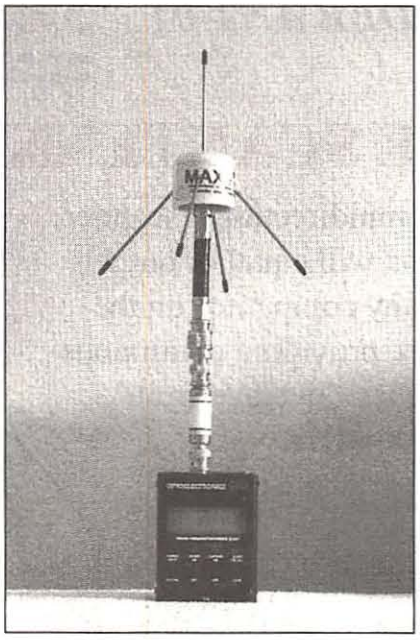
An antenna tower with multiple antennas and multiple users will probably just confuse a frequency counter and frustrate the user.

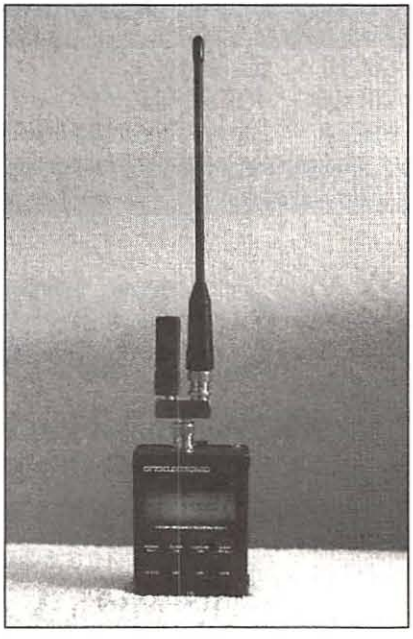


Antenna configurations for various applications, left to right: 440 MHz ham; collapsible; Comet "Miracle Baby" great for 800 MHz; 440/2 meter ham; cellular (800 MHz) and trunk; MAX antenna 800 MHz.

Be prepared ...

To screen out signals you don't want, custom-fit a filter and the antenna to your desired target. Pictured below left is a filter coupled with a great 800 MHz antenna. This collapsible antenna (middle) on an Opto MI counter can be customized to the desired frequency range. (Right) Don't be afraid to experiment!





The frequency counter snagged this Yagi used by the flood control district transmitting at 169 MHz.

enough to acquire a reading unless the signal is either very strong or very close.

Counter Solutions

There are, however, a few tricks you can use to raise the odds a bit in your favor. First, it helps considerably if you know a bit about the signal you're trying to measure.

As a rule of thumb, the longer the antenna, the lower the frequency of the transmitter. For example, a quarter-wave antenna for a citizen's band radio, which operates at about 27 MHz, is approximately 102 inches in length. A quarter-wave antenna for a two-meter and seventy-centimeter ham radio is approximately nineteen inches and six inches, respectively. A quarter-wave cell phone antenna is a scant three inches in length.

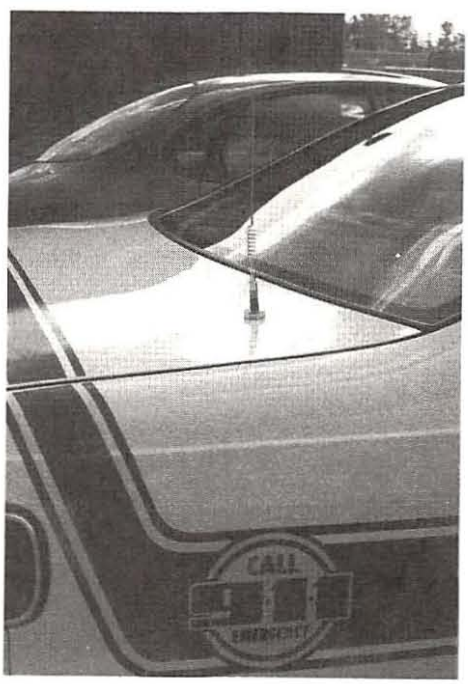
So how does knowing the approximate frequency of the target help? Well, if you can get your counter antenna as close to resonant as possible with the target transmitter's antenna, or at least within the same band, the efficiency of your counter will go up substantially. This may mean carrying several different antennas in your equipment bag. Then, for example, when you see the local volunteer fire department using radios with inordinately long antennas, your best bet is to use the longest antenna available. Conversely, when trying to capture a signal up in the 800 MHz range, a small stub of an antenna will actually work better than a long one.

If you don't want to carry around several antennas with you, it might be wise to invest in a collapsible antenna with a BNC connector (the connector type found on most counters). To calculate how far to extend the antenna, divide 2808 by the target transmitter's frequency and the result is the approximate best antenna length in inches. For example if you were trying to capture a business radio in the 460 MHz range, 2808 / 460 would yield 6.1, or approximately six inches. Now, with your antenna adjusted to that length, you stand a much better chance of success!

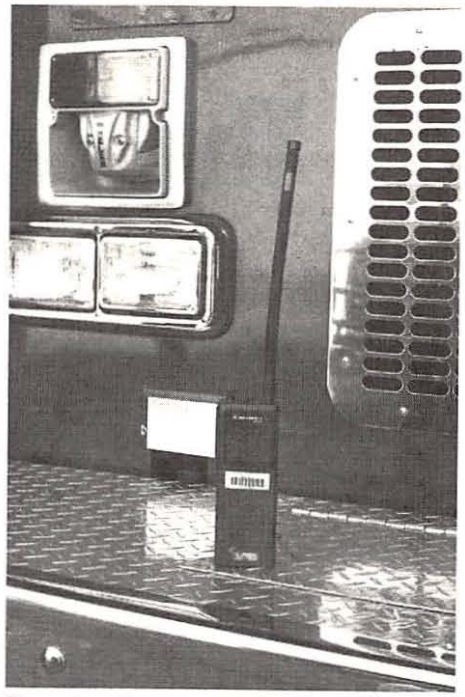
Another trick of the trade is to employ a filter, which is inserted between the counter and the antenna, to help isolate the target frequency. A filter basically attenuates unwanted signals while allowing those in the target range to pass through to the counter. Subsequently, the counter then does not have to contend with as many conflicting signals as it attempts to lock onto the target.

There are three types of filters commonly used: low pass, high pass and notch. The characteristics of the filter (which frequencies it will pass and which it will attenuate or reduce) are shown on the filter's specifications. For example, a 50 MHz low pass filter would only pass frequencies from 50 MHz downward, and would greatly attenuate anything above that range. An 800 MHz high pass filter will attenuate everything below, while passing those frequencies above 800 MHz.

A notch filter is designed to attenuate a certain frequency range, such as the FM broadcast band from 88 MHz to 108 MHz, but will allow everything to pass above and below that range. The combination of the right antenna and a good filter can do wonders to increase the range and efficiency of your counter.



An 800 MHz antenna used on the Harris County trunked system



Knowing the general range of the target frequency can help; the antenna on this handheld tells us it's a low band

One common mistake you should avoid is the use of a broadband preamplifier between the counter and antenna. It seems to make sense that if you amplify the incoming signal, you should be able to increase the range of the counter. However, not only are you amplifying the signal of the intended target, but you amplify all the competing signals and introduce RF noise to the counter, as well. ... Besides, most modern counters already have a preamplifier as part of their circuitry.

Finally, don't be afraid to experiment with different antennas and filters. With a bit of practice and experience you'll be able to employ these techniques with ease.

Frequency counters continue to be an excellent tool for their original intended purpose as test equipment to monitor or align the output frequency of a transmitter. But they can be an entertaining and valuable aid to the radio hobbyist as well. Once you understand its use and limitations, a frequency counter can help you nail those interesting frequencies that have eluded you for so long!

* The Scout mentioned in this article is available from Optoelectronics, 5821 NE 14th Avenue, Ft. Lauderdale, FL 33334. They can be reached at 800-327-5912 or 954-771-2050.

The Dog Eat Dog World of the 1998 CES

(Consumer Electronics Show)

By John Catalano

The consumer electronics business is one of the most insanely exciting businesses in the world. Even the best products are considered "old" and past their revenue producing life cycle in eighteen months or less! You can imagine what that means to the pace of work at consumer electronic companies.

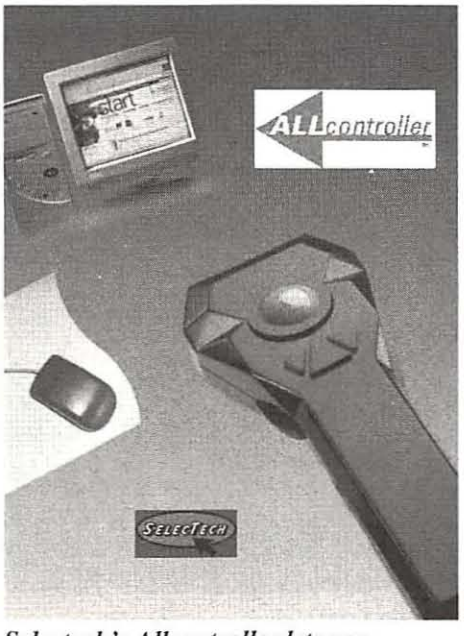
Once a year these "insane asylums" called consumer electronics companies gather to show the world, and each other, the results of their past twelve months' creative efforts. Welcome to the International Consumer Electronics Show — or as it's known in the trade, simply CES. Let's take a tour around the 1998 CES, which was held in Las Vegas, Nevada, January 8th-11th.

"D" Stars of CES 1998

CES promoters proclaimed the main theme for this year's show to be the long-awaited HDTV, High Definition Television. This product, which the politicians of 1991 promised would be the salvation of the then failing world economy, has finally arrived.

HDTV initially promised to bring a higher resolution picture to our TV screens... A TV picture is a collection of dots, or pixels, which our brains integrate into a whole image. Relative to current TV standards, HDTV images have smaller pixels. Therefore, more pixels can be crammed into an image giving the viewer a "higher definition" picture with more detail.

Thomson (RCA), Panasonic, Hitachi, Zenith, Pioneer, Sharp, JVC, Sony and Mitsubishi all exhibited HDTV at CES 1998. The improved image quality was immediately apparent, with the HDTV images looking more like a crisp 35mm projected slide than a TV screen.



Selectech's Allcontroller lets you remote control your computer.

If you have $5000 burning a hole in your pocket then you are ready for HDTV, now! But a few of the manufacturers whom I spoke with do not feel that HDTV will have consumer acceptance until the retail price can be brought "much lower." Only when they can "provide the right product at the right price" will they fully launch HDTV into the mainstream consumer market. Until then it will be a flag-ship, high-end, low sales product.

However, HDTV *will* become a standard if the US government has its way. A usually reliable source indicates the renewal of US TV licenses go "quicker and easier" if they include plans and dates for broadcast of HDTV. Currently, Harris Corp is busy installing HDTV transmission gear in the field. Public Service Broadcasting (PBS) and the CBS network were providing HDTV programming from their experimental stations.

There was a little "slight-of-hand" also helping the HDTV image: Most of the HDTV demonstrations utilized the newly developed, large area (3 feet by 2 feet and bigger) flat screen displays (FPD), which were first shown at Fall 97 COMDEX last November. These $15,000 FPDs beauties make even our current TV images look sharper. The marriage of HDTV and FPD makes for exciting viewing. Add to this a Dolby Digital Surround sound system and it becomes an impressive experience.

The advantage of digital video disks is immediately obvious; but will the public buy it?

Quadraphonic 1998 Style

Back in the seventies audio manufacturers attempted to convince the consumer that they should replace their twenty-year old, two channel stereo systems with new four channel Quadraphonic systems. The idea was that 4-Channel would give the audiophile listening to records, eight tracks and compact cassettes, new "audible spacial dimensional information."

This was to allow the listener to experience the subtle acoustics of the recording venue. "Just Like Being There," read one 4-Channel company's ad campaign. JVC, GE, RCA and H.H. Scott, to name a few, led the failed charge. The concept died a painful and costly death a few years later.

Since then, a new use for sound systems has emerged for which spacial information adds significantly to the entertainment: home theater. Watching the opening sequence of the movie *Independence Day* and having the huge alien mother ship rumbling from behind you, over your head, and then accelerating away in front of you, is a total experience.

Dolby Surround AC-3 provides five totally independent channels of audio: left, center, right, rear left and rear right. And for the real audio crazies it also gives you a channel just dedicated to low frequency effects! The movie title *Blown Away* comes to mind.

Now, this system is not new. First patented in 1992, it began to be available to the consumer in mid-1995 among the high-cost, $800 and up audio equipment. At the 1998 CES, Pioneer introduced Dolby Digital among their midpriced audio products. Economically responsible home theater is now a step closer for consumers.

1998 - The Year of DVD

The Digital Video Disc (DVD) is at a "make or break" stage in its development. This video media combines the physical size of the successful audio Compact Disc and the high quality video/audio performance of the not-so-successful Laser Disc.

The Laser Disc medium has been available for over eight years, but has not been widely accepted. The large physical size and delicate nature of the LP record-sized disc was a negative factor to many consumers. Remember, we were still in the process of replacing our LP records with smaller Compact Discs.

As a result of improved optical coding methods and electronics, Toshiba, Philips, Pioneer, Thomson, Panasonic and JVC all introduced DVD players at the 1998 CES. DVD further intensifies the home theater experience. One company demonstrated a side-by-side comparison of a movie on video tape and the same movie on DVD. The greatly improved quality of the video was immediately obvious. The fullness of the sound was also quickly evident.

It's Now or Never

DVD players were introduced in late 1997 with less than the expected reception from the public. Consumer confusion between the look-alike $99 audio CD players and $500 DVD machines didn't help sales. The small number of available DVD programming added to DVD's sales problems.

This year, all DVD manufacturers are planning heavy ad campaigns to educate the consumer as to the benefits of DVD. Many new DVD titles are being introduced weekly and now available, even in discount clubs such as Sam's and Costco.

Will DVD become a success? DVD sales did hit their predicted mark at Christmas and have started the new year with a spike, higher than expected. A lot of companies are betting on DVD's success in 1998.

1998 International CES

THE SOURCE FOR CONSUMER TECHNOLOGIES

HDTV was given a helping hand by the new flat screen displays, which enhance any image.

Please Reboot Your Car Stereo

In the early eighties the joke in the industry was that someone had developed a can opener which used a microprocessor. Companies realized that the microprocessor had captured the imagination of the consumer and could be used to "hook" sales.

Well, welcome to CES 1998 and Windows CE! It seems like *déjà-vu* all over again. Microsoft, not content with having a firm hold on the computer industry, has quietly and diligently been digging into other consumer areas. Windows CE (consumer electronics), is an operating system which can be configured to run PDAs (personal data assistants), DVDs, TV, audio equipment ... and even car radios (remember the can opener?)!

Blame It on El Niño

Philips' Niño (another effect of El Niño?) is a palm-sized personal computer (PC) that uses a version of Windows CE called Gryphon. Niño is pocket-sized, has a pen-driven touchscreen, an infrared data port, a built-in 28.8 kbps modem, uses a 32-bit RISC processor, and is available in 4 and 8 Mb versions for $339 and $449. This will compete directly with a Pilot PDA.

Casio and LG Electronics (formerly GoldStar) announced that they will introduce a palm PC March/April 98. Casio's Cassiopeia E-10 will be a 4 MB palm PC and cost $399. Watch this product area carefully. If the laptop/desktop big boys feel the competition this could explode, with the consumer being the winner.

Sublime to Ridiculous

Clarion's Auto PC is, um, ... a unique product. How about throwing all sorts of things into a car radio and calling it ... an Auto PC? How about a lack of original ideas?

The Auto PC fits into a standard DIN dashboard slot. It is Windows CE controlled and includes CD player, AM/FM radio, address book organizer, navigational system, an infrared data port, and a full LCD screen as used on digital cameras. The radio pulls out of the dashboard and tilts up to reveal its screen.

At a recent national law enforcement conference, data was presented which showed that the number of accidents due to "cellphone preoccupation" was rising to the level of alcohol related accidents. This product could make drunk driving number two!

One redeeming value of the Auto PC is its use of voice input commands. It responds to 200 voice requests to adjust the radio, CD and navigational system. This is an excellent use of Windows CE. Its text-to-speech feature can also read you the displayed text information.

But how many of us use our keyboard without looking at our displays often? The heads-up-display (HUD), used by fighter pilots, had better be quickly developed for civilian automobiles, before the human race becomes extinct due to high-tech road accidents.

A Quick Walk Around

CES is comprised of at least three separate convention centers: Las Vegas Convention Center and the Hilton and Sands Hotels convention centers. It's a lot to cover. The following are a sampling of unique products shown at the 1998 CES.

IBM introduced a 16 gigabit hard drive which uses Giant Magnetoresistive (GMR) heads. It can hold over seven hours of full motion video or tons of printed pages. Beta units are now out in the field with production units to "follow soon."

The Casio palm PC is one of several competitors which may bring the price down.

Thomson showed a handheld scanner, model RCA RP6198 directed to race car enthusiasts. The user programs the car's number into the memory and the scanner converts it to a frequency.

Also from Thomson is an interesting mix of equipment and functions in its night table clock radio with a built-in carbon monoxide (CO) detector. The idea is that CO kills during sleeping hours, usually from faulty heating systems. Look for model GE7-4882 if you have a need for such a "unique" product.

Uniden demonstrated a voice command cordless phone, EXV98 Voice Dial. It holds up to thirty names and numbers that can be verbally stored and then dialed by saying the name. At $199 it seems light of value.

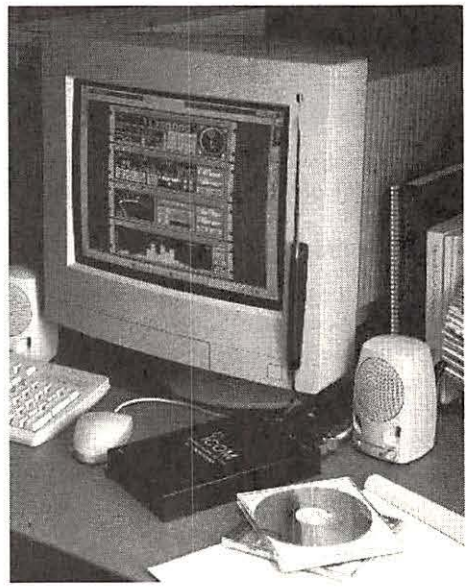
Seiko's handheld Quicktionary converts the written work of one language to that of another. The difference is that the Quicktionary "pen" uses an optical sensor to read the word to be translated. The translated word is then displayed on its LCD. It is planned for market introduction in late 1998 with a price around $250. Spanish, French and English translation capability will be first.

Controlling a screen with "the wave of your hand" describes Selectech's new Allcontroller wireless remote control product. Using patented infrared two-way technology, the computer user just holds the wireless Allcontroller and points it directly at the screen position where they want the cursor. The "cursor follows every movement of your hand." Pretty unique stuff! It works out to 20+ feet. It also can be switched by the user to act as a wireless trackball with a 40+ foot range. In most cases no software installation is required. All this, and a desk mouse which doubles as the IR base, goes for $109.

New and old media capabilities are combined in Pioneer's DV-L909 combi-player. It can play DVDs, Laser Discs, audio CDs and video CDs. The graphical user interface (GUI) really made using it simple and easy. Watch for it this month at around $999.

Texas Instruments showed a video projector which was a collaboration with NEC. The image could be blown-up to movie theater (cinema) size with high brightness and very high quality. At $45,000 it may revolutionize the movie theater business.

There was not much really new from the radio companies. The exception was ICOM, which was showing off their PC wide band radio, the PC-ICR1000. The rumor there was that ICOM was opening the software to third parties, so watch for new software add-ons and operation systems to come from the usual communications software people.



The Icom PC-ICR1000 was one of the few new radios on display.

Uniden was again showing off their trunking capable scanner. Lots of stands, including Motorola and Maxon, were showing Family Radio Service walkie-talkie products —citizens band (CB) for the nineties. Maxon's booth seemed slanted towards CB with all versions being shown.

The CB/NOAA weather-capable radio is back making the rounds. In fact, one company was making a big splash concerning their weather alert radio that beeps when bad weather is approaching. I bought a very similar radio in 1974 from K-Mart. Twenty-three years later it's news again.

My Feet are Killing Me

I apologize to all the other products that we didn't talk about, but I think we covered the highlights. You can check out some (though not yet all) of these products on the manufacturers' websites.

The attendance for CES was about 35 percent less than for COMDEX (Computer Distributors' Exposition; see last month's *MT* report) which took place the previous month at the same venue. The twice yearly CES of the eighties has been trimmed down to an annual event; now it's COMDEX that is going strong twice a year. The 1998 Consumer Electronics Show left no doubt in anyone's mind that consumer electronics is being driven by advances in computer technology. The tail may finally have begun to wag the dog.

WORLD-CLASS DXING

Be Well-Informed and Organized on the Hunt

By Hans Johnson

Listeners tend to overemphasize the importance of receivers and antennas in great DXing — the art of receiving distant stations. Other critical elements such as time, information, and organization receive scant attention. A new receiver hits the market and captures the hobby's attention for months: The folding of a shortwave bulletin is barely mentioned. Yet the publication likely played a greater role in what DXers heard than did the receiver.

The most successful DXers exploit these elements in addition to paying close attention to their receiver and antenna. This article, while providing some general information on receivers and antennas, will focus on these elements of time, information, and organization.


Certificado de Sintonia

Radiodifusora: La Voz de la Federacion Mundial de Ex-Presos Politico de Cubanos
Transmitiendo desde: Tampa, Florida
Frecuencia de: 7001.1 kc/s
Potencia: vatios
Horas: 0047 - 0056 UTC, 7 de septiembre 1991
Fecha: (September 7, 1991)

First verified report outside Florida!

Card: 006

Hemos comprabado sus detalles de recepcion, y confirmamos que la emisora sintonizada es la nuestra.

sello oficial

firma

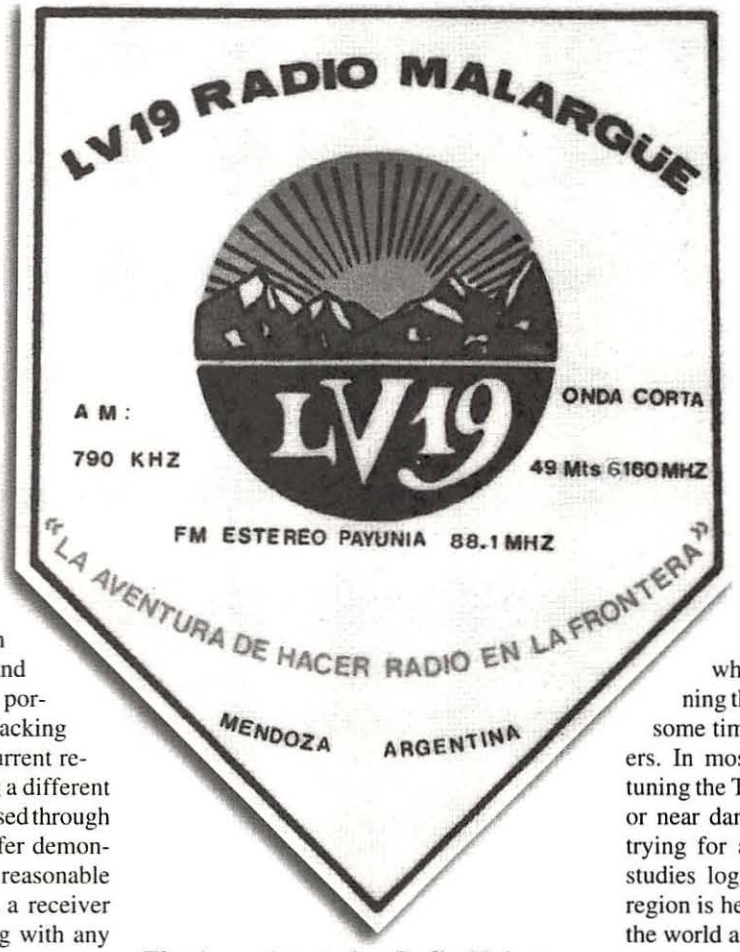
Receivers

Americans love technological solutions to "problems" and this hobby is no different. Often the first question asked

The clandestine La Voz de la Federacion Mundial de Ex-Presos Politico de Cubanos only issued eight verification (QSL) cards. Only two listeners outside of Florida were able to verify the station before it was shut down by the FCC.

in an interview with a well-known DXer is, "What kind of receiver(s) are you using?" The interviewer assumes that the secret to success lies in technology —a superior receiver. Yet a study of contributors' pages to shortwave magazines reveals that virtually all of the well-known DXers only have one receiver. Quite a few of them use rather modest receivers, such as the Sony 2010. Great DXing cannot be achieved solely by purchasing an expensive receiver.

Having said that, what constitutes an adequate receiver? Accurate dial readout, whether digital or analog. Single sideband capability, and both wide and narrow filters. A notch filter, passband tuning, and an automatic gain control are also nice. Many new and old receivers, both tabletop and portable models, fit this bill. DXers lacking most of these elements in their current receiver should consider purchasing a different receiver. Receivers are best purchased through major domestic suppliers who offer demonstration and used equipment at reasonable prices. $600 is all it takes, from a receiver standpoint, to be on equal footing with any DXer.



The Argentine station Radio Malargue will sent a pennant along with a QSL card for a correct reception report.

■ Antennas

Antennas are also an overrated element. Some listeners assume that they cannot hear certain stations because of their antenna setup. Or they jump to this conclusion after reading about a certain DXer's elaborate antenna setup and surmise that they won't be able to hear the same stations. Yet they conveniently ignore the other side of the ledger: that is, good listeners with simple antennas. What is true for receivers also applies to antennas, as many well-known DXers use simple, inexpensive antennas.

If possible, antennas should be strung outside and as high as possible. Insulated wire will work as well as bare and lasts a lot longer. Start off with a simple piece of wire strung in the yard. If this is not satisfactory, be willing to experiment and try different types of antennas. The North American Short Wave Association (NASWA) *Journal*[1] offers reprints of several different antenna articles. Antenna experiments will be much cheaper by building the antennas rather than buying them ready-made.

Apartment dwellers who cannot have outside antennas can tack a wire around the walls of their radio room. A temporary outside antenna, which can be taken in and out quickly, should also be considered. Most DXing occurs at night, so the chances of the antenna being discovered are minimal! String the best antenna possible, but do not allow the antenna to determine what stations to go after.

With an adequate receiver and the best antenna possible, the DXer should now focus attention on the critical areas mentioned earlier. The first of these is *Time*.

■ Time

Time is when a listener tunes the dials and how often. The best catches are not audible every day; they may only be heard twice a month or once a season. Alternatively, a station may only be on the air for a short time due to political or financial circumstances.

Some DXers tend to have one or two big listening sessions on the weekends, but then not listen during the week. Break those big sessions down into daily 20 minute to 1 hour blocks and the odds of hearing unusual stations jump dramatically. Unusual propagation conditions do not escape the DXer who is listening everyday, nor does he miss the station that was only on the air for a few days.

Bear in mind that published logs describe what was heard, but they do not reflect how many times the DXer tried for the station before hearing it. Nor are there any logs of stations that a DXer has attempted to hear for years, but failed to do so. Great catches can be luck, but they demonstrate persistence much more often.

When to listen depends on what the objective is. DXers scanning the bands can listen at any time, but some times are more productive than others. In most areas of the world, the DXer tuning the Tropical Bands will want darkness or near darkness at his location. The DXer trying for a particular region of the world studies loggings sections to see when that region is heard by other DXers in his part of the world and then listens at these times.

The same method is used for hearing a particular station. If the station has not been heard for a while, a DXer should try for it when other stations from the same region are being heard.

■ Information

Successful DXers spend time obtaining information in order to focus and improve their listening sessions. The well-informed DXer now knows when and where to tune. Even if only weak signals are detected, this listener knows they are of interest and will make the best logging possible. The unprepared DXer will be very lucky to "discover" this signal while just tuning around through the bands. Logging it, particularly if it is a weak signal, is much more difficult as the listener has a lot less information to work with. The knowledgeable DXer will know of tests and special broadcasts that the ill-informed one will miss.

Tuning and station information is available via printed materials, over the Internet, and on DX shows. However it is delivered, the information can be broken down into two broad categories. Listening guides are annual

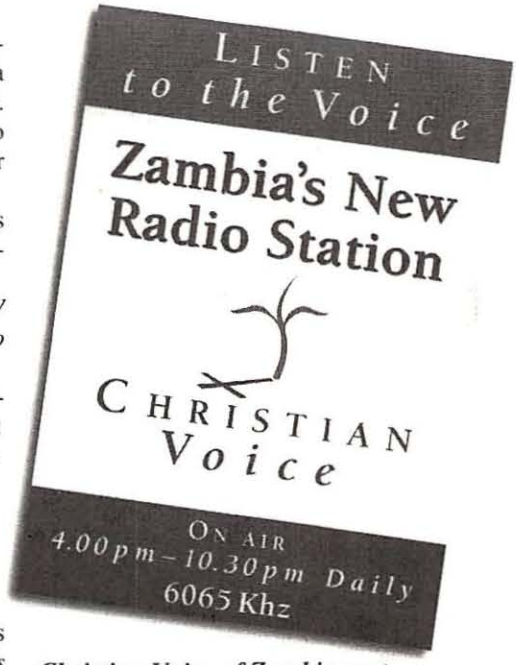
publications that either cover the entire spectrum or narrow the focus based on criteria such as region, frequency, or station network. Other media publicize loggings in addition to providing information on new stations or changes with existing ones.

An informed DXer's media list includes the following resources (see side bar for details).

DXers should get both the *World Radio TV Handbook (WRTH)* and *Passport to Worldband Radio (PWBR)* annually.

There are several excellent soft-copy publications for the DXer with Internet access: *DX Window, Broadcasting DX (BCDX), Electronic DX Press (EDXP),* and *Cumbre DX.*

Those without Internet access should take out a subscription to the *North American Shortwave Association's Journal* and the *Danish Shortwave Club International's (DSWCI) Shortwave News.* Study the loggings in both and the section entitled, *Listener's Notebook* (NASWA), *World News,* and *DX News and Tips* (DSWCI).



Christian Voice of Zambia sent this rare mini-poster to some of the first listeners to verify the station.

DXers without a computer and unable to afford the above-mentioned subscriptions should focus on shortwave shows. *Monitoring Times* publishes schedules for these programs every three months in its Shortwave Guide section. The programs providing the most pertinent information are: *World of Radio, DXing with Cumbre, Media Network, DX Partyline* and *Communications World.*

■ Organization

Successful DXers must do more than just monitor the above media. They must organize the gathered data in order to take advantage of it. Use the *PWBR* and *WRTH* as baselines and then pencil new information into the appropriate sections of these books. The books remain up to date and new information is organized and easily found.

Copies of Internet publications are best kept as soft copies with each publication being placed into a different file. The files quickly become important references in themselves, as any data can quickly be located using the "search" tool.

Interesting schedules and lengthy station information from printed materials can be clipped or photocopied and then placed into a *WRTH* or *PWBR.*

Important audio clips from DX shows, such as interval signals or national anthems, should be recorded.

Additional processing occurs with items of great interest. These tips are made into a "hit list." The hit list, organized by time, also has fields for the country, station, and frequency. The list is placed near the radio and serves as an instant and constant reminder of targets that a particular DXer is especially interested in.

■ Conclusions

A receiver and antenna are necessary for DXing, but so is information. Without such information, every DXer would be attempting to slowly create a radio database from scratch!

A more expensive receiver or antenna may improve reception, but following the above ideas improves listening dramatically and is virtually free. Use the recommended resources to obtain the latest information. Organize that information to keep reference books current and to create a hit list.

Armed with your hit list, listen daily, even if it is only for 20 minutes. Be persistent and never give up on a station. The greatest joy and greatest rewards await those who put in their best, well-informed and organized effort.

Resources for the Informed DXer

Both the *World Radio TV Handbook* and the *Passport to World Band Radio* are available from Grove Enterprises. See their advertising insert in this magazine for more information. Listeners who cannot afford these books can write the *Cumbre DX* book project at: P.O. Box 392, Odenton, MD 21113, USA. If available, an older copy of one of these books will be sent to you.

Soft-copy DX publications are generally free to those contributing to them. Here are the contact names and addresses:

DX Window	Finn Krone	<dkol1727@vip.cybercity.dk>
BCDX	Wolfgang Bueschel	<100523.3446@compuserve.com>
EDXP	Bob Padula	<100026.262@compuserve.com>
Cumbre DX	Ulis Fleming	<ulis@ix.netcom.com>

Queries on subscription rates for the NASWA *Journal* may be sent to: NASWA, 45 Wildflower Road, Levittown, PA 19057, USA.

Queries for *Shortwave News* may be sent to: DSWCI, Tavleager 31, DK-2670 Greve, Denmark. Or try the e-mail address listed above for *DX Window.*

Schedule times for Glenn Hauser's *World of Radio* can probably be found by looking at Glenn's column on page 34, or via Internet at **www.grove.net/~ghauser/**

The latest schedule of *DXing with Cumbre*, which is broadcast via WHRI and KWHR is available via: WHRI, P.O. Box 12, South Bend, IN 46624, USA: Internet **http://www.grove.net/~cumbre/** or <ulis@ix.netcom.com>

Radio Netherlands' *Media Network* can be reached at: P.O. Box 222, 1200 JG Hilversum, The Netherlands. Internet **http://www.rnw.nl** or <letters@rnw.nl>

HCJB in Ecuador produces the *DX Partyline*: Casilla 17-17-691, Quito, Ecuador. Internet **http://www.hcjb.org** or <kmacharg@mhs.hcjb.com.ec>

Kim Elliott at the Voice of America hosts *Communications World*: Voice of America, Washington, D.C. 20547, USA. Internet **http://www.voa.gov** or <ke@voa.gov>

A Simple Battery DIScharger

PARTS LIST

RL:	relay, 5 volt dc, SPDT (RS 275-243)
LED:	light emitting diode, 12 volts (RS 276-209)
S:	switch, momentary, push button, SPST, normally open (RS 275-1517)
R:	potentiometer, 100 ohms, linear taper, not a trimmer
2	alligator clips or other means of connecting to the battery

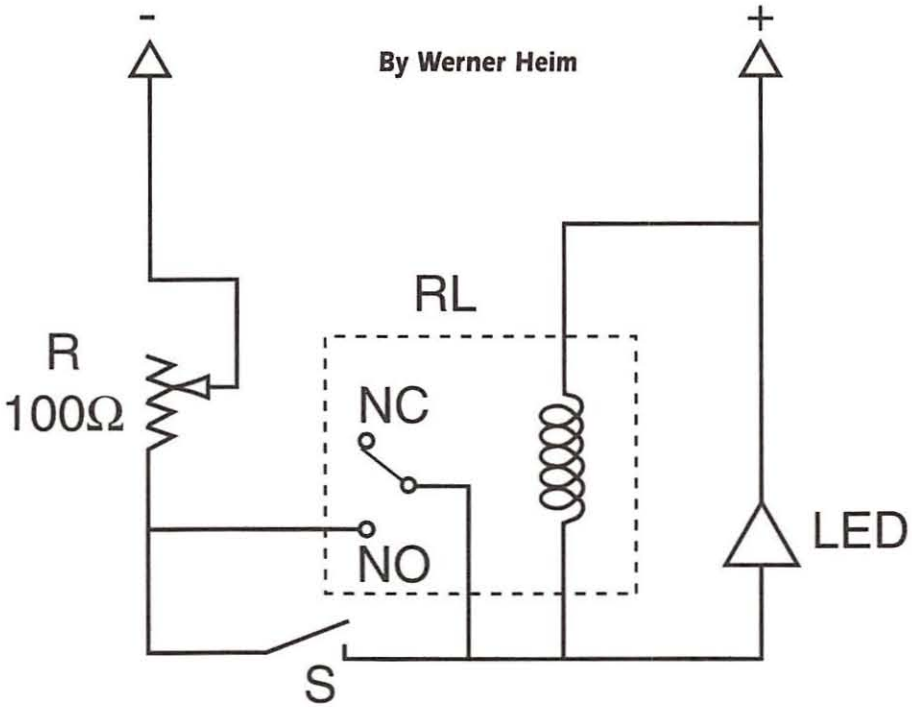
By Werner Heim

In November 1993, the "Experimenters Workshop" column in *Monitoring Times* outlined plans for a very fine battery charger. Here is a simple companion device: a battery *discharger*.

Why would anyone want such a gadget? Most NiCd rechargeable batteries do not recharge properly unless they have first been discharged to their design voltage. The common "six pack" of cells is fully charged at 8.64 volts and fully discharged at 6.0 volts. However, many pieces of electronic equipment, especially hand-held scanners, stop working when the battery voltage drops to a figure considerably above 6 volts. To assure a proper charge, the battery should then be discharged to 6.0 volts before being recharged.

While it is possible to discharge the battery by simply putting a resistor of appropriate value and wattage across the battery terminals, such uncontrolled discharging may drop the battery well below six volts, possibly shortening its useful life. The simple device described here automatically stops the discharging at bout six volts.

The circuit is shown in figure 1. Point-to-point wiring is suitable and the entire device can be installed in a very small project box such as RS 270-230. The parts needed are shown in the chart at top of the page.



Before use, adjust the resistance between the two external connectors with the potentiometer to 125 ohms while the push button switch depressed. Some individual adjustment from this value may be necessary as the coil resistance and drop-out voltage of relays can vary from unit to unit.

To use, connect the battery, observing polarity. (If polarity is reversed, no damage is done, but the LED will not light.) Then depress the switch momentarily. The LED should light up. When the LED goes out, the battery is at its proper discharged voltage. Let it stand for an hour or so, then measure its no-load voltage. If it is too low, increase the resistance between the external leads a little: if too high, reduce this resistance.

Once the resistance has been properly set, it should need no further attention.

That's all there is to it!

Bearcat Intercepts Trunked Radio

COMMUNICATIONS ELECTRONICS INC.

New...Bearcat Trunktracking radios

Save big on Bearcat 235XLT or BC895XLT radio scanners during our 29th anniversary. To get your **free fax-on-demand catalog**, call 734-663-8888 from the telephone handset on your fax machine and follow the recorded voice prompts. Get many free benefits such as extended warranty coverage on new Bearcat scanners when you use your Communications Electronics Platinum Plus Master Card® issued by MBNA. No annual fee. Call 1-800-523-7666 anyitme and mention offer Q3KI to request yours today.

DISTRIBUTOR'S COUPON	EXPIRES 4/30/98	#980208

SAVE $45 on one **BC895XLT**

Save $45 when you purchase your Bearcat 895XLT scanner directly from Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Telephone orders accepted. Call 1-800-USA-SCAN. Mention offer UNITM8. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase and only on specified product.

Bearcat®895XLT-A Radio Scanner

Mfg. suggested list price $729.95/**Special $319.95**
300 Channels • 10 banks • Built-in CTCSS • S Meter
Size: 10-1/2" Wide x 7-1/2" Deep x 3-3/8" High
Frequency Coverage: 29.000-54.000 MHz., 108.000-174 MHz., 216.000-512.000 MHz., 806.000-823.995 MHz., 849.0125–868.995 MHz., 894.0125-956.000 MHz.

The Bearcat 895XLT is superb for intercepting trunked communications transmissions (see BC235XLT description) with features like TurboScan™ to search VHF channels at 100 steps per second. This base and mobile scanner is also ideal for intelligence professionals because it has a Signal Strength Meter, RS232C Port to allow computer-control of your scanner via optional hardware and 30 trunking channel indicator annunciators to show you real-time trunking activity for an entire trunking system. Other features include ***Auto Store*** – Automatically stores all active frequencies within the specified bank(s). ***Auto Recording*** – This feature lets you record channel activity from the scanner onto a tape recorder. ***CTCSS Tone Board*** (Continuous Tone Control Squelch System) which allows the squelch to be broken during scanning only when a correct CTCSS tone is received. For maximum scanning enjoyment, order the following optional accessories: **PS001** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **PS002** DC power cord - enables permanent operation from your vehicle's fuse box $14.95; **MB001** Mobile mounting bracket $14.95; **EX711** External speaker with mounting bracket & 10 feet of cable with plug attached $19.95. The BC895XLT comes with AC adapter, telescopic antenna, owner's manual and one year limited Uniden warranty.

Bearcat®3000XLT-A Radio Scanner

Mfg. suggested list price $699.95/**Special $329.95**
FREE - Get an extra BP2500 battery pack, a $51.95 value when you order a Bearcat 3000XLT. Hurry...offer expires 4/30/98.
400 Channels • 20 banks • Twin Turbo Search/Scan
Frequency Transfer • VFO Control • Automatic Store
10 Priority Channels • Selectable Mode • Data Skip
Frequency step resolution 5, 12.5 & 25 KHz.
Size: 2-3/4" Wide x 1-1/2" Deep x 7-3/8" High
Frequency Coverage:
25.000-549.995 MHz., 760.000-823.995 MHz., 849.0125–868.995 MHz., 894.0125-1,300.000 MHz.

The Bearcat 3000XLT is the ideal handheld radio scanner for communications professionals. This handheld scanner scans at 100 channels per second and searches at a rate up to 300 steps per second. A selectable attenuator eliminates annoying intermodulation from adjacent frequencies in highly populated areas. Selectable AM, Wide FM and Narrow FM modes allow you to change the default receiving mode of the BC3000XLT. For maximum scanning pleasure, order the following optional accessories: **UA502** Cigarette lighter power cord for temporary operation from your vehicle's cigarette lighter $14.95; **LC3000** Deluxe swivel leather carrying case $49.95; **BP2500** rechargeable nickel-cadmium battery pack for up to five hours of dependable use $39.95; **ANTMMBNC** Magnetic mount scanner antenna with BNC jack and 12 feet of cable $29.95. **ANTSGBNC** Glass mount scanner antenna with BNC cable $29.95. The BC3000XLT comes with AC adapter, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Order today.

TrunkTracking Radio

DISTRIBUTOR'S COUPON	EXPIRES 4/30/98	#980202

SAVE $45 on one **BC235XLT**

Save $45 when you purchase your Bearcat 235XLT handheld scanner directly from Communications Electronics Inc., PO Box 1045, Ann Arbor MI 48106 USA. Telephone orders accepted. Call 1-800-USA-SCAN. Mention offer UNITM2. TERMS: Good only in USA & Canada. Only one coupon is redeemable per purchase and only on specified product.

Bearcat®235XLT-A TrunkTracker

Mfg. suggested list price $429.95/**CEI price $269.95**
300 Channels • 10 banks • Trunk Scan and Scan Lists
Trunk Lockout • Trunk Delay• Extra battery & charger
10 Priority Channels • Programmed Service Search
Size: 2-1/2" Wide x 1-3/4" Deep x 6" High
Frequency Coverage:
29.000-54,000 MHz., 108-174 MHz., 406-512 MHz., 806-823.995 MHz., 849.0125–868.995 MHz., 894.0125-956.000 MHz.

The Bearcat TrunkTracker BC235XLT, is the world's first scanner capable of tracking a selected radio transmission as it moves across a trunked radio system. Now it's easy to monitor fleets and subfleets in analog trunked radio systems. The BC235XLT can also work as a conventional scanner. This 300-channel, programmable handheld scanner provides scanner users with uninterrupted monitoring capabilities of Type I, II, IIi and hybrid trunking systems. One of the biggest obstacles in the scanner industry has been the increasing use of trunking radio systems in business and public service agencies throughout the United States and Canada. This makes it nearly impossible to track a conversation as it moves within a trunk system from frequency to frequency. According to Ken Ascher, WB8LIT, Chairman & CEO of Communications Electronics, "The Bearcat 235XLT is a revolutionary breakthrough in scanner technology. Now it's easy to continuously monitor conversations even though the message is switching frequencies." The BC235XLT comes with AC adapter, CRX120 battery charger, two rechargeable long life ni-cad battery packs, belt clip, flexible rubber antenna, earphone, owner's manual and one year limited Uniden warranty. Not compatible with AGEIS, ASTRO, EDACS, ESAS and LTR systems. Call 1-800-USA-SCAN to order your scanner now.

VHF/GMRS/CB Radios

Have fun and use our CB, GMRS and commercial radios to keep in touch with friends. For even bigger savings, *Monitoring Times* magazine readers use the coupon on this page and save more.

Cobra 148GTL-A SSB CB/SPECIAL	$139.95
Cobra 148FGTL-A SSB CB with frequency counter	$179.95
Cobra 29WXST-A CB with sound tracker technology	$149.95
Cobra 2010GTLWX-A SSB CB Base (†$25.00 shipping)	$299.95
Cobra HH45WX-A Handheld CB radio with weather	$89.95
Cobra FRS200-A Family Radio Service transceiver	$89.95
Maxon GMRS210+3-A GMRS transceiver/SPECIAL	$166.95
RELM RH256NB-A 25 watt VHF mobile transceiver	$284.95
RELM MPV32-A 5 watt VHF handheld transceiver	$299.95
Uniden GRANTXL-A SSB CB Mobile	$124.95
Uniden PRO538W-A CB &Weather	$54.95

Save up to $995.00

It pays to be a *Monitoring Times* magazine reader. Order any scanner or transceiver from CEI. Send or fax this coupon with your order and save even more.

VR204DAT8 8 channel digital audio logger	Save $750.00
HS100 RELM 100 channel handheld scanner	Save $15.00
HS200 RELM 200 channel scanner with CTCSS/DCS	Save $55.00
LC3000 Leather carrying case for BC3000XLT	Save $10.00
LC235 Leather carrying case for BC235XLT, SC150	Save $20.00
29WXST Cobra CB with sound tracker technology	Save $15.00
LCMP RELM swivel deluxe leather carrying case	Save $20.00
BCMP RELM rapid charge ni-cad battery charger	Save $10.00
SMMP RELM speaker/mic for WHS or MP radio	Save $10.00
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The Little Scanner Feature That Couldn't

These are exciting times in scanning. Some great new products have debuted in the past year — most notably the Trunktrackers, RELM's CTCSS/DCS-capable scanners, and the PCR1000 from ICOM. In thinking about these and other radios, however, one has to wonder about their various features and how many of them are actually used.

In some ways the bells and whistles are akin to the optional accessory list on a car, except that, unfortunately, you don't have a similar choice of features from which to pick and choose. While you can opt to purchase a tone board for the Uniden Bearcat BC-760 or BC-9000, you can't, for example, elect to save ten dollars by doing away with the Send key on the BC-9000 when you call your order in to a dealer.

So often when consumers purchase products, whether it be a car, a VCR, or most anything else, we have the choice of spending more dollars to either upgrade a particular model with more accessories or to step up in model class to a more expensive, and more feature-laden, edition. How many of us have laid out more cash for the TV with picture-in-picture, only to never use it? How many of us have laid out extra dough to purchase the scanner with 500 channels, only to use 300 or so?

Here's a "quick-and-dirty" list of often little-used scanner features. Your comments and additions to the list would be appreciated.

Over 300 or 400 channels

How many of us really scan more than this number of channels at one time on any scanner? It's like trying to search the 225-400 MHz military aircraft band by setting the limits at either end of this spectrum. It's too much to search at one time, and you'll miss too much.

Just like you're counseled to narrow your search ranges, you should limit the number of channels you scan so you don't miss conversations on channel three, for example, when your scanner is scanning by channel 437 (although a fast scan rate helps).

While it may make sense to have a scanner with scads of channels if you lock certain banks out each time you scan, the best way to scan in this manner nowadays is to use a computer-programmable (and controllable) scanner into which you can download your channel sets.

Data Key

When we first saw this key on some Uniden (and later, on Uniden-built Radio Shack models), many wondered, "wow, can I track a trunk with this or perhaps follow MDT communications?" (Now that *would* have been interesting.)

Alas, the data key allows the scanner to skip certain paging transmissions (the beeps and boops we could all care less about). Really, how many of us listen to those paging frequencies to begin with? (I'm not talking about decoding them...which is a serious no-no.) If you're actually turned on by those pager beeps and boops, please put this magazine down and immediately seek assistance.

No one would program 454.025 into their radio and no one would search the 454-455 MHz band or any other paging portion of the spectrum, anyway. Sure, if you're receiving intermod from those grossly over-powered paging transmitters, I suppose the data key might help. And, if the manufacturer wants to throw in that or any other fluff-feature on a radio, we'll take it even if we never use it. (I never adjust the tilt steering on my car, but I didn't choose *not* to buy the car because this feature was included.) Just, please, don't try to charge us extra for it!

On the TrunkTrackers, the data key also now doubles as a key to enter into the fleet-map programming process as well as to check which bank you're trunking. At least we're getting our money's worth now.

The Send Key

This is one of my favorite all-time useless keys. How many of us SEND the programming of one channel into another channel? Don't we all just reprogram the radio?

Turbo Scan or Search

Why wouldn't you want to scan or search as fast as possible? This feature is, we believe, more to show that the scanner can be sped up unlike no other scanner....and that you have the option to speed up at your own choosing. This follows along nicely with our car analogy. However, in a car there's usually an understandable trade-off — you usually trade gas-mileage for speed, for example.

But, with a scanner there's no trade-off. You gain nothing by going slower: If you can search faster, then go ahead and search faster.

Lockout Review

This isn't a bad or useless feature; it's just one that we find we hardly ever use. Lockout review allows you to step through the channels in the radio which are locked out so you can make the choice of whether or not you wish to unlock them. It's not something this author does too often, but we'll take it.

Super-High End Scanner Features

100 kHz band scope — Who uses it? Signal navigation? Remote control from your couch?!

Notice to scanner manufacturers: if you want to give us these features, that's great! We may use them once or twice and perhaps a handful of customers will use them daily. But give us CTCSS/DCS capability and trunktracking first! Or, now that we've got Motorola trunktracking, how about addressing the other trunking protocols? We could go on and on.

If we've dumped on any one of your favorite scanner features, please let us know. Perhaps we've underestimated its value. Certainly, we applaud the manufacturers' efforts to provide us with something more than Scan, Manual, Lockout, and Delay ... it's just that sometimes they give us features that we'd trade back in for cash if we could. (I'd like to hear from you at *Scanmaster@aol.com*)

Scanner Fears

On the Internet's SCAN-L list server, Jeff Kettell recently posed the following thought-provoking and somewhat troubling question:

"Maybe it's just me or maybe it's the fact that I am not living near Metropolitan Boston any longer. But this weekend the country has heard about the wake of Michael Kennedy, son of late US Attorney General Robert F. Kennedy from Hyannisport, Massachusetts. As can be expected, media from all over New England and from the national networks as well as the tabloids were all in Hyannisport to cover the story. As I live only two miles from the Kennedy Compound, you would think that I stumbled onto a gold mine.

"Well, it was not anything like I would/should have expected. The scanners were quiet...a scary quiet...hopefully not a sign of the times ahead. As mentioned, it could possibly be that since this is a good one hour south of Boston, the city news crews could not use their radios to talk with the control rooms in Boston. Everyone was using cellphones — *everyone* — police officers, still photographers, video photographers, news anchor persons, even the general public that gathered outside of the media barricades. There was very little communication heard between 450.000 to 451.000 MHz and 455.000 to 456.000 MHz — the 'normal' press/media channels — as the people at the barricade talked back to the satellite trucks parked further down the road from the gathering area on simplex freqs.

"And yes, there was an IFB (interruptable fold back) or two within the 161.xxx MHz band. But not nearly as active as one would expect. The only 'exciting' thing I picked up with the Opto Scout were two wireless microphone freqs on the video cameras, one at 185.xxx MHz and the other at 209.xxx MHz.

"Cellphones were probably even used as live audio feeds back to the control rooms. (One can only guess, as it would be illegal to listen to these comms, especially one that I assume would go from Hyannisport back to the control room of CNN in Atlanta!)

"Even the local police department was controlling their part of the ordeal by sending info back and forth over MDTs (Mobile Data Terminal) from the command post to the station. Also, there were a couple of distinctive beep beeps from those Nextel radios/phones/pagers.

"Is this the future of scanning? Everything is becoming impossible to listen to on your everyday over-the-counter scanner!"

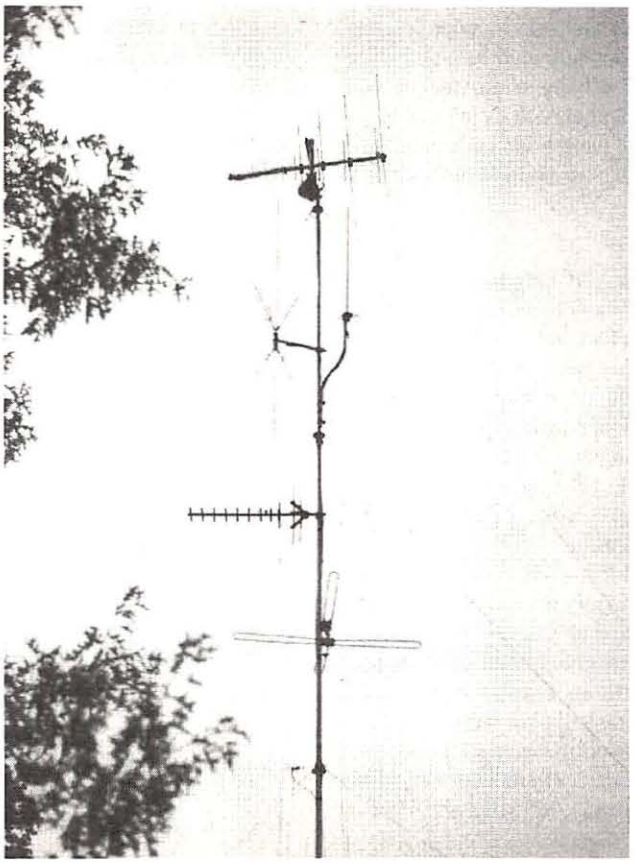
Certainly Jeff has some valid points. Ten or twenty years ago at an event such as this, the airwaves would have been rife with VHF and UHF analog communications to which he could have listened. Yet technology, which has brought us cell phones, digital PCS and NEXTEL services, mobile data terminals (MDTs), and the like, has also brought us an increasing number of repeaterized systems, so that we're able to monitor both sides of many conversations.

This year, technology brought us the Trunktracker, and, for the first time since the dawn of trunking (Motorola trunking, at least),

we're able to follow these rather sophisticated communications systems. Matter of fact, in the past the sheer number of these communications would have been far fewer. Trunking, with its hundreds or thousands of talkgroups per system, allows for many more two-way users and radio paths.

Fifteen years ago, when the town of Barnstable (where these reporters gathered for the Kennedy wake) operated on a simplex VHF high-band system, you generally could only hear cruisers when they were within a few miles of your location. Now that they operate on an 800 MHz repeater system, you can hear all the patrol cars and portables.

Yes, there may be some MDT activity, but it's a trade-off. And, speaking of those MDTs, in the Kennedy situation MDT equipment may have frequently been used, but one must remember that the wake was a contained event that the police had planned to cover for two or three days. During an emergency of some sort, there would be no time for preparation and voice traffic would have most assuredly been more prevalent.



Gary Hickerson's 30-foot antenna array.

We shouldn't be surprised to hear about the lack of activity on the 450 and 455 MHz media frequencies. In the Boston area, these channels are very active, despite the fact that all reporters and photographers also have cell phones and recognize that the competition is listening to the regular two-way. The network affiliate 450/455 MHz repeaters of Boston/Needham, which are located some 70-odd miles from Cape Cod, are probably just too far from the Cape to hit with a five-watt portable. Those more expert can correct me if I'm wrong, but the electronic news gathering (ENG) communications from the Cape to the assignment desks in Boston were probably coordinated either through cell phones or, more likely, through the satellite uplink.

At one time this editor would have agreed with Jeff. Considering the Trunktracker and other new scanner technologies, though — as well as the recently established mandate as to the need for scanners (and eventually digital scanners) for the public safety community following the H.R. 2369 circus — we think the future is much brighter than we might have otherwise believed.

Beaming in the Signals

Gary Hickerson of Fort Smith, Arkansas, was kind enough to send us a picture of his impressive antenna set-up. Gary writes, "I was reading your article in the December *Monitoring Times*. I have a few questions. My present scanner equipment consists of the following: Bearcat 9000XLT, 950XLT (the Scanner World version of the 760), and the Sportcat SC-150. My antennas are the Channel Master 5094A Monitenna, the Grove Scanner Beam, and the Scan 150 omni antenna plus the Channel Master HD rotor." We also see what appears to be a UHF TV beam antenna and a low-band ground plane, Gary, but please correct us if we're wrong.

Gary would like better performance on VHF as he likes DXing high-band police signals. He asks what our experience has been with such equipment. He writes further, "I need a good 10-13dB gain VHF 155 MHz beam. I had the idea to buy a Cushcraft A148-10S ten-element, 2-meter, 13.2dB gain beam for $64.95, but I've been told by many people that it won't work. They say the gain falls off steeply above and below the 146-148 (ham 2-meter) range. Seems like the more elements and the more gain the more narrow the bandwidth."

This editor has not had a good experience with the one VHF-beam that was tried. The professional beam was tuned to 155 MHz and supplied with a 155 MHz preamp on the tower, but the effect was marginal at best. While we have found UHF and 800 MHz beams to be outstanding, VHF has been sorely lacking. If any of our readers has any words of wisdom for Gary, please write.

Consumer Electronics Show 1998

We started the column looking back at the new equipment introduced in 1997. But what was showcased as coming up in 1998 at this year's Consumer Electronics Show (CES) in Las Vegas?

On the scanner side of the Uniden booth, the BC-895XLT was prominently (and deservedly) displayed as the latest and greatest. No new mobile scanner was introduced, but Uniden did announce that a new mobile TrunkTracker, to be named the BC-780 (not the 765 or 795 as suggested on the Internet) is under development.

The Florida-based RELM company was displaying their new MS-180 and MS-200 mobile scanners. It's good to see the former Regency scanner company back in the business, as competition breeds better pricing and technology for all concerned.

While we checked our convention guide for AOR, Alinco, Yupiteru, and GRE (Radio Shack is not a manufacturer and never has had a booth), the only other scanner maker with a public presence at the show was ICOM. This high-end developer was touting their exciting PCR1000, the black-box receiver you connect and control through your PC's serial port. (See John Catalano's two-part review in the February and March issues.)

There was one very surprising new entrant into the scanner marketplace this past year: RCA. The GRE-manufactured RP6198 scanner was displayed in the "CES Innovations Design & Engineering" pavilion. Besides the fact that this scanner is specifically designed for the automotive racing enthusiast, this scanner is also notable for its color: bright red!

Watch for more on this new equipment in future issues as *Monitoring Times* returns for a closer look.

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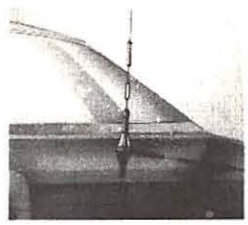

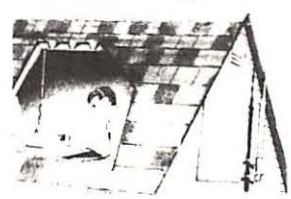

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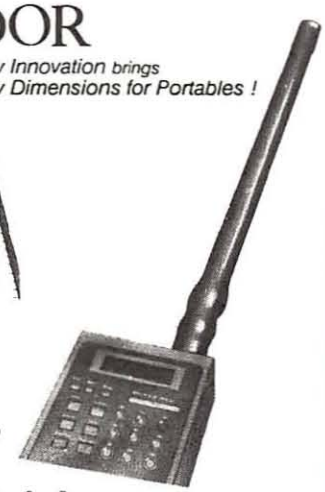

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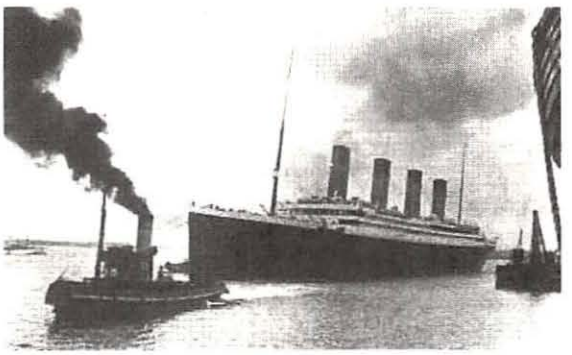
A Sea Change in the Maritime Mobile Service

A couple of events at the end of 1997 have focused quite a bit of attention on the Maritime Mobile Radio Service, which is used worldwide by ships at sea and by the shore stations that communicate with them.

First of all, several European countries took the end of 1997 as an opportunity to drop their CW (Morse code) watch on 500 kHz, joining the U.S. Coast Guard among agencies no longer using this very romantic, but very slow, mode. As always, this was a sad occasion, marked by shaky fists on the key, and tears in the eyes of even the crustiest old salts.



The Titanic disaster led to the establishment of a standardized CW distress frequency.

A typical farewell message came from Land's End Radio in England. It concluded, "...NOW THE TIME HAS COME, OURS IS NOT TO REASON WHY, THE SATELLITES ARE CALLING, OUR MORSE TRANSMITTERS DIE. MARCONI IF YOU CAN HEAR US WE SALUTE YOU DE GLD 31/12/97 AR DE GLD." (As copied and posted to the Internet by Day Watson of the UK.)

To understand why these signoffs are always so emotional, we have to look at the second event. This is the worldwide popularity of Hollywood's latest megabuck disaster yarn, *Titanic*. Obviously, this doomed vessel and its entirely preventable loss have lost none of their mythic power in eighty years. Therefore, it is not surprising that a genuine sense of mourning, rational or not, inevitably attends the dismantling of the communication system that they created.

Titanic and the SOLAS Convention

Don't make the mistake of thinking in too modern terms where *Titanic* is concerned. For example, she actually carried more lifeboats than required by British law, though still nowhere near enough for everyone on board. In 1912, there were no weather pictures, no Global Positioning System (GPS), no ice patrol, no navigation aids, no warning broadcasts. Ships depended on good navigation, and upon each other.

Wireless in 1912 wasn't new, but it wasn't compulsory either. *Titanic's* two "Marconi Operators," Jack Phillips and Harold Bride, weren't ship's officers. They were contract employees from Marconi Wireless. *Titanic's* radio room, like the kitchen or the band, was there to make money for the ship. While it is not true that Phillips and Bride ignored ice observations from other ships, their first job was indeed to move "wish you were here" traffic from paying passengers, handled at a huge profit to White Star Lines.

Nor was *Titanic* the first ship to use SOS. This distress prosign, sent as one long character, had been in wide use since a 1908 radio treaty, but Marconi stations, especially on British ships, were reluctant to drop the old CQD (Hello all stations, distress) that they had invented. Phillips, who was at the key, tried SOS on Bride's advice after several CQDs had gone out. Bride, in fact, survived the sinking. Though suffering from frostbite, he insisted on relieving *Carpathia*'s own, fatigued radiomen.

All this gave Marconi Wireless its finest hour. For days, crowds grew outside the shore stations, as operators tried to copy any word on survivors. Their heroic performance created the romantic image of the skilled, dedicated radio service, its highly trained members tapping calmly on keys while everyone else lost their heads, saving lives as part of a day's shift.

After the *Titanic* disaster, the world got serious about maritime wireless. Acts of the U.S. Congress, and then of world bodies, created a class of "compulsory" ships, usually any vessels over 300 gross tons or which carried more than 12 passengers. Treaties, which together made up the SOLAS (Safety Of Life At Sea) convention, required compulsory ships to carry three radio officers with a specified level of equipment and proficiency. They also established a 600-meter CW calling and distress frequency, which led to our current 500 kHz allocation.

Finally, the SOLAS convention required a continuous global watch on this frequency — by all stations, both ship and shore. To make sure that weak distress calls would be heard, a 3-minute silent period was provided at 15 and 45 after the hour. It was marked on clocks in radio rooms worldwide. Later, a partially automated system rang bells if a distressed vessel transmitted long dashes, but this did not replace the radio watch. The system, once in place worldwide, provided reliable communication for over 60 years.

Non-compulsory ships, with voice radios, were handled by the addition of a watch on 2182 kHz, and coastal information bulletins on 2760 kHz, both AM or USB. This gave them a sure way of contacting compulsory ships, and their communication network. Safety was again served.

GMDSS Steps In

This system worked very well, pretty much guaranteeing that a distress call would be heard and handled in a timely manner. However, it was extremely labor-intensive. It was expensive, and it lagged behind changing economic realities of modern seamanship. Reluctantly, in 1988, the International Maritime Organization amended the SOLAS to require a completely new setup, from DC to daylight, which automated the radio watch. This is the famous GMDSS, or Global Maritime Distress and Safety System, which continues to change every aspect of seafaring radio, worldwide. It's a completely new approach to ship distress radio, centralizing and networking it to Rescue Coordination Centers (RCC), and cutting man-hours by several magnitudes.

Since *Titanic*'s loss is what created much of our distrust in technology, the image of a few boxes with lights replacing the skilled, fearless ship's "sparks" didn't exactly give anyone a "warm fuzzy." Perhaps we gave Morse code, or voice for that matter, the heave-ho a little too fast. Perhaps we didn't. But it's done, and so heave we must.

■ Digital Selective Calling on MF/HF

On February 1, 1999, compulsory ships will need full GMDSS capability, and they will not need any other equipment or personnel, though they can choose to retain these. At this point, all mandatory radio watches will cease, on all frequencies, everywhere, except for some coastal waters with different laws. As we've noted, 500 kHz is already pretty much gone, though we still hear Morse from a few CW coastal stations such as KFS, Globe Wireless, on nearby channels. The watch on 2182 kHz will undoubtedly stop soon after this date. The continuous guard of VHF channel 16, now done by practically anything that floats, will last some years longer, but not forever.

This poses a major problem for all non-compulsory vessels, from pleasure boats to working tugs. As of next year, they won't be guaranteed a means of contacting compulsory ships for safety purposes. Nor does the current equipment guarantee that their distress calls will be heard. Even if they are, radio direction finding services will no longer be mandatory, perhaps making it harder to locate vessels. At least some of GMDSS has to be implemented worldwide on just about anything that floats ... and quickly, if we do not want to place lives in danger.

For this reason, maritime HF (high frequency, 3000 kHz to 30 MHz) and MF (medium frequency, 300 to 3000 kHz) are quickly moving to Digital Selective Calling (DSC) for all traffic. DSC resembles the SELCAL (Selective Calling) that has long been in use by maritime RTTY (Radio Teletype) and voice aero mobile stations. However, it includes more information.

You've probably heard DSC already if you listen to much maritime HF. It sounds like a computer data burst. You're going to hear a lot more of these. Most new radios will have this capability, and even some ham transceivers are implementing an amateur version of the standard.

DSC divides the world's oceans into four types of areas. **Area A1** is the coastal zone, typically out to 20 nautical miles, within range of VHF stations with DSC alerting services.

Area A2 is the coverage area served by MF coastal stations, the traditional 500 kHz band, but with some new systems. One of them is NAVTEX (Navigational Telex), an automated SITOR-B service for bulletins and warnings on 518 kHz. NAVTEX is being implemented by coast guards worldwide; it is relayed over simple and reliable teleprinters, with just a few bells and whistles so that messages won't print out more than once. It continues the historic use of medium wave, with its reliable groundwave propagation. Listeners in coastal areas are encouraged to try copying NAVTEX with hobby equipment. It's easy and fun, and schedules are widely available in radio documents or on the Internet.

Area A3 is that major portion of the planet, such as the high seas, covered by the three geostationary birds of the INMARSAT (International Maritime Satellite) system. DSC will be available on ship uplinks, along with some other features, such as automated position tracking using GPS, the Global Positioning System. SafetyNet, a message system resembling NAVTEX, is also available. INMARSAT stations use a slightly extended version of the DSC standard. Another extended DSC ID will be used by EPIRBs (Emergency Position Indicating Radio Beacons).

Finally, **Area A4** is that portion of the polar latitudes, typically above 70 degrees north and south, where INMARSAT cannot be guaranteed. Primary communication here will still be good old HF radio, with DSC capability.

MF/HF, while still around, is getting a bit of a new look. The radio watch, automated or otherwise, will shift to the new DSC calling frequencies. The U.S. Coast Guard is currently taking DSC calls on 2187.5, 4207.5, 6312, 8414.5, 12577, and 16804.5 kHz all FSK (frequency-shift keying). Such a call includes a frequency for reply, allowing contact to be established anywhere the vessel has capability. MF/HF DSC calls will have distress and test modes, plus an all-ship calling mode.

The U.S. Coast Guard, along with other agencies worldwide, has been publicizing 2187.5 as the new safety and distress frequency for all DSC-equipped vessels. Activity on this one is picking up. All-ship calls can be heard from coast stations with bulletins. Tests are also heard, plus "nuisance" calls from new users who try to use the channel for casual RTTY calls.

■ A New Kind of Callsign

While marine radios will still get traditional callsigns, just about anything that can transmit on water will need a Maritime Mobile Service Identity (MMSI). This is defined in ITU regulations as, "...a series of nine digits which are transmitted over the radio path in order to uniquely identify ship stations, ship earth stations, coast stations, coast earth stations and group calls."

Think of an MMSI as a SELCAL on steroids. Ultimately, they will replace traditional SELCALs for ship RTTY, but they will also be used for all other DSC calls. The MMSI is obtained from the relevant licensing agency in the country of registry. For example, in the United States, FCC will issue civilian MMSIs, and NTIA (National Telecommunications and Information Administration) will handle federal/military ones. Existing licensees must file for amendments to receive their MMSIs.

For ships, the first three numbers of the MMSI are specific to the country of registry, like a callsign prefix.

These digits comprise the MID (Maritime Identification Digits), and they will be of the most interest to casual monitors. The United States is using 366, with federal and military stations having a 9 in the next place (3669). Lists of these IDs should ultimately be as widely available as callsigns and RTTY SELCALs are now.

When used by other classes of stations or traffic, the MID moves around a bit. Leading zeroes are prepended for general calls (a "CQ"). A general call to a group of ships has one zero before the MID, and for coast stations we add two. For example, the U.S. Coast Guard's Communication Area Master Station, Atlantic (CAMSLANT) would be called with 003669995. The USCG group ship call is 036699999, and the group coast station call is 003669999.

A little understanding will get us through this awkward transition time. There's no reason that maritime mobile radio's digital future should not be even better than its manual past.

Utility Loggings

Hugh Stegman

Abbreviations used in this column

ANDVT	Advanced Narrowband Digital Voice Terminal	MAP	Maghreb Arabe Presse
CW	Continuous Wave (Morse code)	m/v	Motor Vessel
EAM	Emergency Action Message	PAP	Polska Agencja Prasowa
Foxes	THE QUICK BROWN FOX... test	RAF	Royal Air Force
GHFS	Global High Frequency System	RY	RYRYRY teleprinter test tape
JANA	Jamahiriyah News Agency	SITOR	Simplex teleprinting over radio, modes A & B.
		Unid	Unidentified

2390.0 PEBN-m/v *Fenja* working unid vessel at 0010. P3ZL5-m/v *Batavier* working m/v *Heerenplein* at 0024. PKFB-m/v *Klippergracht* calling m/v *Amy* at 0034. PFYN-m/v *Ambassador* calling m/v *Marietje Andrea* at 0034. PHJU-m/v *Jens* working m/v *Heerenplein* at 0035. PEDX-m/v *Francisca-S* working m/v *Regulus* at 0043. PGML-m/v *Olivier* calling *Ranger* at 0048. PDXP-m/v *Eemsdiep* working m/v *Mercator* at 0107. PFWG-m/v *Marinier* calling m/v *Visserbank* at 2337. PGPL-m/v *Osiris* working m/v *Ladon* at 2351. (Ary Boender - Netherlands)

3068.0 Acid Test working Nightwatch 01(unheard) at 0412. Set Z165 as primary, Z100 secondary. (Jeff Haverlah-Houston, TX)

4745.0 WAR 46 working Nightwatch 01at 0059, 0209, 0640 and 0706. WAR 46 working Nightwatch 01 at 2336. (Haverlah-TX)

5861.5 Lynx (no other call given) idling SITOR-A and CW at 0003. (Jack Dix, Yonkers, NY)

6697.0 6PG-British Royal Air Force working MUL. (T. Vlismas-Crymych,UK)

6712.0 Acid Test calling Mainsail, no response. (Haverlah-TX)

6715.0 Tampa Tim working Nightwatch 01, entering net at 1606, and making ANDVT secure voice check at 1615. (Haverlah-TX)

6739.0 Offutt GHFS with 6 char EAM 5227L6 for Head Dress at 0738. Then began 110 char EAM, but could not finish, noting "disregard," then broadcasting Foxtrot prefaced with "Fairly." (Haverlah-TX)

6757.0 Acid Test working Nightwatch 01, went to Z100 at 0411. Again at 0522, going to Z175. (Haverlah-TX)

6795.0 Unid Spanish numbers female with 5-digit code groups in AM at 0623. (Jones-SD) *It's our best guess that these come from near Havana. -hugh*

7695.0 GWD 1-unid country radio checks with O3GM, 2AAI, BMWI, NGAI, PMEG, KKMK for over 1 hour in CW at 1043. Other stations weak. (Boender - Netherlands)

7710.0 MKK-RAF London, with RY and foxes in Baudot (50 baud) at 1118. (Boender - Netherlands)

8492.0 P-Russian Navy marker from Kaliningrad in CW at 0859. (Boender - Netherlands) *These are single-letter channel markers for Russian Navy data or telemetry channels. They tend to cluster close together in freq. -hugh*

8494.8 S- marker in CW at 1213. (Dix-NY)

8495.1 F- channel marker in CW at 1211. (Dix-NY)

8532.0 LZW 42-Varna Radio, Bulgaria, traffic list in CW at 0908. (Boender - Netherlands)

8541.0 UIW-Kaliningrad Radio, Russia, with Cyrillic traffic in 50 baud at 0903. (Boender - Netherlands)

8633.0 Unid Spanish numbers female with "Atencion" preamble, then 5-digit code groups in AM at 0407. (Burgess-MA)

8968.0 Lajes AB, Alaska, with a 6-character EAM at 1458. Lajes with a 6-character EAM for Hightide at 1939. Both EAMs began with "Echo Yankee." (Vlismas-UK)

9016.0 Nightwatch 01 working WAR 46 with radio check, then went to Z135. Rhetoric calling Nightwatch 01, no joy at 0041. Jonathan passing EAM to Nightwatch 01 at 1546. Also working WAR 46 at 1558, Tampa Tim with QSY to Z160 at 1606, again with ANDVT secure voice check at 1716. Followed by data tones at 1725, and Nightwatch simul EAM on Z190 and Z175. Nightwatch 01 working Legbrace, setting Z150 primary and Z175 secondary, at 0412. Moved to Z205 at 0422. Salesman (?) working Nightwatch 01. Nightwatch working WAR 46 with radio check at 2316. (Haverlah-TX)

9041.3 5YE-Nairobi Meteorological with aeronautical traffic in RTTY (100/856) at 2329. (Bob Hall-Cape Town, RSA)

9018.0 Gaser 95 working Gaser 94, strong at 0314. (Haverlah-TX)

10101.0 DDK2/DDH7-Hamburg Meteorological with ID and RYs in RTTY (50/474) at 2338. Simulcasting on 4583 and 7646 kHz. (Hall-RSA)

10204.0 Nightwatch 01 working Tampa Tim (unheard) with two tone data. Nightwatch 01 with 26 char EAM simul on 9016 at 1949, then calling Tampa Tim at 2021, then another 26 char EAM, same simul, at 2039. (Haverlah-TX)

10214.8 HZN48-Jeddah Meteorological with aeronautical traffic in RTTY (100/826) at 2355. (Hall-RSA)

10363.8 Unid RTTY (50/833) repeating number "225" at 0005. (Hall-RSA)

10551.2 GFL23-Bracknell Meteorological, UK, with weather synopsis in RTTY (75/366) at 0015. (Hall, RSA)

11175.0 RU840 phone patch thru MacDill GHFS regarding cargo offload at 2251. Shark 89 working Lobo with cargo list at 2227. Then AirVac 634 phone patch to Andy requesting divert to Travis for repair and fuel. (Jones-SD) *Air Evac 634? Nice catch -hugh.*

11244.0 Offut GHFS with 6/20/26 char EAMs at 1533. (Haverlah-TX)

11494.0 Jail Door working Nightwatch 01, requesting QSY Z175, but sent to Z211 instead, at 1938. (Haverlah-TX)

12070.0 Jail Door working Nightwatch 01 at 1939, left net at 1956. (Haverlah-TX)

12186.0 JANA, Tripoli, Libya, with news in English, Baudot (50/408) at 1418. (Dix-NY)

12811.3 HZY-Tannurah Radio, Saudi Arabia, traffic list and marker at 1406. (Dix-NY)

13585.9 CNM 85X11-MAP, Rabat, Morocco, with news in French, Baudot at 1524. (Dix-NY)

14727.0 Unid 5-digit weather code groups in Baudot (75/500) at 1518. (Dix-NY)

14912.0 DFZG-MFA, Belgrade, Serbia with Baudot RY (75/418) at 1431. (Dix-NY)

15448.0 Banger working station sounding like Extract in some sort of exercise. Extract advised that two Blackhawk helos were shot down. Banger told Charcoal and Abatement that multiple UH-60s were destroyed, crews killed, at 1744. Banger working Buffalo, who said that targets were disapproved due to weather. Banger being told by Acumen that Webfoot 01 was shot down, traffic was challenged and authenticated, at 1752. Banger promised to cut down multiple challenges, saying, "I won't spoof you." (Haverlah-TX)

16795.5 RTMA-Potigorsk, Russia, with traffic for Sevastopol, Russia, in RTTY (50/170) at 1255. (Hall-RSA)

16807.5 GKE6-Portishead Radio, UK, with warning bulletin that the British Coast Guard was dropping its maritime watch on 500 kHz CW. Transmission in SITOR-B at 1301. (Hall-RSA)

17005.0 ZRH-Silvermine, Africa, with a NAWS (Notice to Allied War Ships) marker in RTTY (75/170) every two minutes at 0848. (Hall-RSA)

17037.0 YQI-Constanta Radio, Romania, with hand sent CW marker at 1410. (Dix-NY)

18320.7 RFFIC-Marine Sirpa Paris with sports news in French to AIG2135 and RFTJD (Libreville, Africa) in ARQ RTTY (192/400) at 1122. (Hall-RSA)

18648.5 SOT 265B-PAP Warsaw news in Polish, SITOR-B (100/170) at 1418. (Dix-NY)

19225.5 DMK-Bonn, Germany, in ARQ RTTY (228.7/170), idling and undecoded transmission at 1202. (Hall-RSA)

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SITOR-A, the Maritime Mode

The Simplex Telex Over Radio (SITOR) code (*a.k.a.* SPECTOR and AMTOR) is a 7-bit synchronous error correction code based on the CCIR 476 standard. It is used extensively for maritime and embassy communications. SITOR signals are always sent at 100 baud, generally using 170 Hz shift.

SITOR Mode A is used for individual communications between two stations. A duplex circuit is normally involved, with the transmitting station on one frequency and the receiving station on the other. As the transmission progresses, the receiving station acknowledges error-free reception or requests retransmission of the last part of the message. It is this procedure that normally makes this mode error-free between two stations.

SITOR-A is used for ship-to-shore communications, and it's an excellent place to start if you're new to the digital modes.

SITOR Mode B is a broadcast-only mode from one station to several other stations. Error correcting is done at the transmitting station and there is no feedback from the receiving stations. In this month's column we will focus on SITOR Mode A (*a.k.a.* ARQ and TOR). It is used almost exclusively for ship-to-shore communications, although a number of embassies use it as well.

Unlike other modes, SITOR-A is a relatively easy catch. The reasons for this are several. It is an easy mode to recognize — the characteristic "chirp-chirp-chirp" of a transmitting signal is unmistakable. It is an easy mode to tune on your decoder since the baud rate and shift remain constant. For maritime usage, the signals are concentrated in specific frequency ranges in specially allocated marine bands.

Maritime traffic is almost never encrypted, so that message content is always in-the-clear. In addition, even though your monitoring post is not in a position to request repetition of a garbled signal, it is a mode that seems the least prone to produce garbled text on your screen. And finally, although much maritime traffic has gone to satellite, there still are thousands of vessels out there that continue to use this mode — and will for a long time to come.

How it Works

The station originating the transmission is known as the Information Sending Station (ISS). The receiving station is known as the Information Receiving Station (IRS). During an ISS transmission characters are sent in blocks of threes. Watch your screen the next time to observe this characteristic.

After the transmission of each block the IRS sends a control character to acknowledge reception or request retransmission. If you sometimes see characters being repeated on your monitor, there is nothing wrong with your decoder; the IRS has requested retransmission, and whatever is sent and how many times it is retried is what you'll see.

It is possible to identify the IRS sending control characters by its unique one "chirp" sounds, but, as there is no printable message content, there's not much point monitoring these signals. On some frequencies you might hear what sounds like two SITOR-A broadcasts. In actual fact, what you are monitoring is the ISS and IRS on the same frequency. Using sophisticated timing protocol, both stations can share a simplex frequency. During idle periods, you will hear the high and low tones and your mark and space indicators will alternately flash.

During a transmission either station may send control codes which change the ISS/IRS arrangement — making the receiving station the sending station, and vice-versa.

Decoding SITOR-A

Almost all decoders include the SITOR-A mode, from the most rudimentary to the most sophisticated. It remains one of the easiest modes to decode because of its standard baud/shift rate. Be aware, however, that stations may be idle (with no traffic being sent) for long periods of time. Many decoders support an idle indicator to alert you to this condition.

SITOR-A Frequencies

The maritime bands are divided into frequency bands for fixed coastal stations and mobile bands for ships. A good place to easily locate SITOR-A transmissions are in the coastal station bands. Tune between the following frequencies: 6314.0 kHz to 6330.0 kHz, 8415.0 kHz to 8437.0 kHz and 12579.0 to 12658.0 kHz. There may be several stations from different countries on the same frequency, so you may see several languages. Frequency spacing is generally .5 kHz apart.

The Egyptian Embassy in Washington puts out a strong SITOR-A signal in North America. Look for them in the local evening EST between 14,500 and 14,950 kHz. They often send 5-letter code groups, but usually identify at the completion of each group.

Good luck and good hunting until next month, when we will look at the SITOR-B mode.

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Why Women Don't Like DXing

There are notable exceptions, as my women friends in the hobby are quick to point out, but a report on ABC's *20-20* seems to provide an answer to the mystery of why the great majority of people involved in DXing are male. In a story about why many women complain that men don't pay attention to what they are saying, it was also shown that male and female brains are wired differently; something to do with the amount of connection between left-brain and right-brain.

Men have no trouble ignoring extraneous conversations in a room full of people, and focusing on what they want to hear. Women, on the other hand, because of their brain-wiring, cannot tune out the interference. This could result from the lifestyle of the earliest humans: men-hunters needed to concentrate on the sound of a particular animal being pursued; women-homemakers needed to be conscious of all potentially threatening sounds.

Although Deborah Roberts didn't bring up DXing, the application seems obvious to us. Women have a much lower tolerance, it seems, to digging difficult-to-hear signals out of the noise. Indeed, one contributor to *Review of International Broadcasting* observed that his wife who liked oldtime radio shows would nevertheless want to quit listening whenever an otherwise good AM signal would start to fade.

But there's still hope for women and DXing. Even people who have lost significant portions of their brain are able to regain some functions which would otherwise have been lost. Amazing things can be accomplished with sufficient motivation.

ABKHAZIA Abkhaz R. carries Radiostantsiya Yunost from Moscow when not airing their own programs. 9494.8 is 5 kW at Sukhumi carrying the 1350 kHz program feed (Kai Ludwig, Germany, *Cumbre DX*) 9494.76 at 0534-0650 in Jan including Mayak 0600-0630 (David Clark, Ont., DSWCI *DX Window*)

ALBANIA R. Tirana's Albanian service on 7270 at 2300-0400/0500 includes an amazing variety of music, from Cajun-sounding to Mideastern to Albanian rap (Fred Waterer, *DX Ontario*)

ANGOLA VORGAN has a new address: Democracy in Angola, Inc., 1629 K St NW, Suite 503, Washington, DC 20006. But the US government ordered UNITA offices to close, so try reporting via Action for Southern Africa, 28 Penton St., London N1 9SA, UK (Nick Grace and Dan Henderson, DC, *Cumbre DX*) R. Galo Negro heard on 6225 ex-6220 at 2045-2104*, heavily jammed (Mahendra Vaghjee, Mauritius, *Cumbre-DX*)

ARGENTINA *De Colección* program from R. Provincia de Buenos Aires heard on 15820-USB Sun 2335 with English ID offering QSL cards (Bob Hill, MA, DSWCI *DX Window*)

AUSTRALIA RA revised sked toward NAm includes: 2100-0600 17795, 2130-0100 13755, 2200-0900 15510, 0100-0800 15240, 0600-0830 11880, 0800-1400 9580, 1200-1800 6020, 1200-2130 9770, 1400-2130 5995, 1700-2130 11880 (Nigel Holmes, RA)

Another frequency for Australian Defence Forces Radio is 15707-USB at 0430-0630 (Hans Johnson, *Cumbre DX*) Heard 0500-0522* (Ben Hester, NC, *ibid.*)

AZERBAIJAN Naghorny Karabakh Region, 9677.08, strong 0600-0628 but audio FMing, local news in Azeri, drift to 9677.097, seems at least 50 kW (Vladimir Titarev, Ukraine, NU via BC-DX) Reply by mail received after four months, from "V. of Justice from the Republic of Mountainous Karabagh," Wed and Fri 0600-0630, Tue and Fri 1500-1530 (Harald Kuhl, Germany, DSWCI *DX Window*)

BELARUS Radiostanzya Belarus, in German Sunday at 0630-0700 on 7210 uses 15 transmitters of 5 kW each, likely former jammers, combined to a single 75 kW; likewise the home service on 6115 (Kai Ludwig, Germany)

BELGIUM On Jan 1, BRTN became VRT--Vlaamse Radio en Televisie, a limited company, no longer a federal authority. As a part of it, RVI's E-mail address changes to rvi@vrt.be (RVI via BBCM)

BOUGAINVILLE R. Free Bougainville was still active in Jan, despite the truce, 0900-1100 on 3865. Broadcasts still depend on the crushing of coconuts for oil to keep the generator going, per Vikki John of the Bougainville Freedom Movement (Hans Johnson, *Cumbre DX*)

BURMA [non] Democratic V. of Burma programs are produced just across the Thai border at Dawn Gwin Camp by a half dozen young broadcasters, one-time student activists, in a steamy jungle hut; then sent by foot, vehicle and plane to Norway for broadcast back on SW on the DVB (AP via Mike Cooper) *1245-1345* on 15330 via Germany, including music requests. New website has detailed program sked and two-week archive of every show in RA: **http://www.communique.no/dvb/**(Nick Grace, *Cumbre DX*) Although well-heard in Kansas, the DVB via Norway at 1430 on 11850 could not be heard when I visited Vietnam, not far from Burma (Wendel Craighead)

CANADA *RCI Mailbag* returned to Mark Montgomery, who invited Sheldon Harvey, CIDX, to provide DX segments; times include Sun 2131 on 9805; Mon 0230 on 6155, 9755 (gh)

CFVP, 6030, continues to relay AM 1060 with big band music, and at 0400-0600 daily a Chinese program for HK immigrants done by a group called "Apple Radio" (Hans Johnson, *Cumbre DX*)

CHINA New E-mail address of CRI: crieng@mail.cri.cngb.com (Matt Francis, *Electronic DX Press*)

Beijing Broadcasts for National Minorities are in Uighur, Kazakh, Korean, Mongolian; and in Tibetan: 0000-0026 11630, 11375, 8566; 0530-0556 15670, 11630, 11375; 1030-1056 11630, 11375, 8566; 1300-1326 11630, 8566, 5995 (BBC Monitoring)

COLOMBIA R. Majagual, HJQX, 4290.3 = 3 x 1430 from Sincelejo in morning news at 1100 (Henrik Klemetz, Colombia, *NU* via *Radio Nuevo Mundo*) Not to be confused with the Mexican, *q.v.*, which does not come on until 1155 and is exactly 4290.0 (gh)

CONGO R. Congo Liberté, Brazzaville, was renamed R. Liberté in mid-Dec (BBC Monitoring)

COSTA RICA RFPI's new time for our *Continent of Media* is Fri 1930, Sat 0330, 1030; pending start of *Pacifica News* weekdays at 2300, old time also continues, Wed 2300, Thu 0700 (gh)

CYPRUS TURKISH Bayrak TV has been added to two radio channels on Internet, including news in English-- **http://brt.emu.edu.tr**(Bayrak TV via BBCM)

CZECH REPUBLIC While 7345 remains on the schedule for most broadcasts, R. Prague in English at 0330 is on 7350 to NAm, 11600 to SW Asia (via Gigi Lytle)

ECUADOR Don Moore is now doing a Latin America DX report on the first Sat of each month on *DX Partyline* (HCJB)

[non] New HCJB relay via UKOGBANI at 1800-1900 in Russian, Ukrainian and another language, IDs as *Golos s Gory* (V. of the Mountain), an ID never heard on SW from Ecuador (Nikolay Pashkevich, Russia, DSWCI *DX Window*)

ERITREA [non] V. of Democratic Eritrea, *1500-1530* daily on 9230, responds to address given in Feb. Eritrean Newsletter included article on it, ELF-RC Radio Station, **http://home.erols.com/meskerem/**(Nick Grace, DC, *Cumbre DX*)

ESTONIA R. Tallinn, English service on 5925, M-F 1615-1630 in winter, 1515-1530 summer; Monday 2000-2030 winter, 1900-1930 summer (Ilona Hausmann, Eesti Radio via Kai Ludwig)

ETHIOPIA [non] V. of Oromo Liberation is on every day but alternates sites, all at 1700-1800: M/W/F/Sa 9980 via Kiev; Tu/Th/Su 11605 via Germany (*PanView*, Bulgaria) Sked remains confusing, as some days on neither frequency, other days on the wrong one (Hans Johnson, *Cumbre DX*)

FRANCE [non] RFI and CRI renewed transmitter exchange agreement for three years; allows RFI 8 hpd on SW, MW to Vietnam and India via Xi'an, Kunming, Hainan (AFP via BBCM)

GABON Africa No. 1 has revamped website, including news, E-mail, job offers: **http://www.africa1.com**(BBCM)

GEORGIA V. of Hope, Hereford, UK transmits from here at 1400-1530 English/Hindi to As on 9310; 1700-2100 English/Russian to Eu on 6290 (BBCM)

GERMANY DW faces budget reductions and must follow a rigid austerity course, further reducing personnel; program budget remains the same, and transmission costs will increase (Dieter

All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; J-97=May-Sept; Z-97=Summer season; W-97=Winter season; [non] = Broadcast to or for the listed country, but not necessarily originating there.

Weirich, Director, via BBCM)

GUAM Both KSDA and KTWR were damaged by the record-strength December typhoon. They were put off the air for a while and made repairs as quickly as possible (gh)

HONDURAS This is where Jeff Baker says he will be broadcasting from; AmeriNet raising $150,000 for this, so likely small transmitters, and was to drop his show on WWCR in Jan (Hans Johnson, *Cumbre DX*) WWCR show continued, UT Tue/Thu/Sat 0000 on 5070, as he invited supporters to fly in to San Pedro Sula, and then claimed on WWCR to be originating from his "mountaintop in the middle of Honduras," pending the imminent collapse of the USA. Meanwhile we've received copy of a bounced $3800 Baker check to WRMI, following other unpleasant experiences with him by WWCR, WINB and WGTG (gh)

After distorting for a while around 3308, R. Luz y Vida was back on 3249.6 with three IDs in a row at 1209, birthday greetings (gh, OK)

INDIA AIR Itanagar, 4990 heard again after a long time, in Hindi at 1459 and 0040 (Mahendra Vaghjee, Mauritius) Back after several months off, *0025-0125+ and +1200-1630*, for the predominantly tribal state of Arunachal Pradesh in the northeast; nearly 50 distinct tribal languages and dialects are spoken (Sarath Weerakoon, Sri Lanka, UADX via *BC-DX*) see also **SIKKIM**

INDONESIA VOI settled momentarily on 11785 for English at 0100-0200; also look out for the *Kang Guru* program in English Mon 1000-1030 on RRI R. Nasional Dua channels including 9680, 11750, 11885, sponsored by the Indonesian Australian Language Foundation, address Kotapos 3095, Denpasar (Matt Francis, Australia, *Electronic DX Press*) English at 0800 also on 11785, 2000 on 15150 (Robert Jones, *EDXP*)

INTERNATIONAL VACUUM [non] WLIO-TV, ch. 35 in Lima, Ohio, planned to start carrying the World Radio Network on its secondary audio program (SAP) channel. That would include *World of Radio* and all the international broadcasters on its 24-hour service (gh)

IRAN Monitoring of VOIRI proves big chaos: alternative frequencies changing from one day to the next, such as 7135/7145, 9615/9620, 9730/9735, 9740/9745, 9745/9750; two programs, languages and transmitters on one frequency, such as 13605 at 1100 Arabic plus English, 1200 English plus Italian; 7145 2130 Bosnian plus Farsi; English at 1100 on 11875 starts with end of Italian program at 1056--but there is no Italian at 1000-1100 (*Panlview*, Bulgaria)

IRAQ [non] V. of Rebellious Iraq, supporting an Iranian-sponsored Shi'i group, and believed to transmit from Iran: 1300-1530 in Arabic daily on 6020v (BBCM)

IRELAND [non] West Coast Radio Ireland began the new year by announcing that its NAm service might cease at the end of Jan unless financial backing could be obtained from the state. Listeners could help by writing to Ms Sile De Valera, Minister for Communications, Dublin or *Minister@ealga.irlgov.ie* (Finbarr O'Driscoll, Eire, *R.I.B.*) Or Dept. of Transportation, Energy and Communications, 25 Clare St., Dublin 2 (Joe Kenneth Wood, SC)

ISRAEL Reshet Bet 1600-0700 to Eu/NAm on new 7497.5 ex-7495 (*Panlview*, Bulgaria)

ITALY V. of Mediterranean, 9660 at 1130-1300 in English, French, German, was thought to be usual Russia relay, but HFCC registrations show Rome (Kai Ludwig, Germany) Two of Rai's six 100 kW SW transmitters are not accounted for at 0900-1300 in its own schedule, so one of them is available for Malta relays on 9660 (Bob Padula, *Electronic DX Press*)

By imposing a $15K annual license fee, it really seems the PTT is trying to shut down our non-profit, non-commercial radio station. It will be more difficult to survive 1998 than 1997. If you can offer support, financial or otherwise, please E-mail info@nexus.org (Alfredo Cotroneo, NEXUS/IBA, IRRS SW) Daily 0600-0830 & 1700-2100 3985, 2100-2200 English 3955; Sat & Sun also 0300-0600 7120; Fri, Sat & Sun also 0830-1600 7120, 1600-1700 3985 (BBCM) see also SWITZERLAND

JAPAN [non] While R. Japan via Canada has reduced English in evening, the morning relay on 6120 now carries both hours at 1100-1300, if reception holds up, yawn (gh, *R.I.B.*)

JORDAN R. Jordan started a new feature in Jan, *Jordan Ancient Cultures*, Sun 1430, repeated Mon 1530 on 11690 (Edwin Southwell, *Review of International Broadcasting*) And *Friends Abroad* mailbag was Thu 1230-1255, to repeat Sat 1530 (gh)

KAZAKHSTAN [non] R. Almaty had English 1019-1039 Wed on 9620, 11840 via Kiev, Ukraine (Erik Køie, Denmark, *BC-DX*)

KIRIBATI R. Kiribati, 9809.95, telltale PTP transmitter open carrier already on at 0434, *0459 with tone, fanfare, ID, lengthy local news to 0519, then distinctively domestic islander vocals. Good steady signal; some audio in LSB but mostly USB (David Clark, Ont., DSWCI *DX Window*)

KOREA SOUTH Han Hee Joo's new temporary co-host on RKI's *Multiwave Feedback* is María Echevarría (gh)

KURDISTAN V. of Iraqi Kurdistan, new address: KDP, 2025 I St NW #1008, Washington, DC 20006, replacing a P O Box in VA. All mail is forwarded to their facilities in Sulaymaniyah, Iraq; active daily on 4160 or 4130 at *0400. For an investigative report on the Kurdish situation see **http://www.qsl.net/yb0rmi/kurds.htm**(Nick Grace, DC, *Cumbre DX*)

LAOS Lao National R & TV, 6130, had English lesson from Canada at 1258-1313. Always strong, some days on almost 24 hours (Wendel Craighead, Vietnam)

LEBANON V. of Hope, 9960, has not carried Dr. Gene Scott for three years. Sked is 2200-2130 mostly in Arabic, except English 1600-2100 (Gary Hull, manager via Hans Johnson, *Cumbre DX*)

LIBERIA Government closed down Star Radio in early Jan for not being registered, and distributing news via Internet; probably a political move ordered by Pres. Charles Taylor (BBC *Newsdesk* via Tony Jones, *NU* via *BC-DX*) Actually, Star Radio not recognized by government, but R. Monrovia fined for allowing Star to use its frequencies (Star Radio manager, R. Netherlands Media Network) Was funded by US AID as a neutral voice for political groups; ongoing government crackdown on Liberian media (Reuters via Andy Sennitt, DSWCI *DX Window*) Had been heard on 5880 at 2033-2104* Hans Johnson, FL, *Cumbre DX*) Then Pres. Taylor closed down a station he owns, Kiss FM, for "inefficiency," AFP reported (BBCM)

MALTA [non] V. of Mediterranean relays via Russia: GPR-1 Moscow 2000-2200 7440; GPR-8 Khabarovsk 0200-0530 Sun 17570, 0200-0500 Sun 15550 (Nikolai Rudnev, Russia, *BC-DX*) E-mail: vomradio@dream.vol.net.mt (Dennis Allen, *Australian DX News*) see also **ITALY**

MÉXICO R. México Internacional E-mail is imerte04@telecommex.com and website includes program schedule, info on staff: **http://www.telecommex.com/imer/rmi.html** (XERMX)

A 1-kW MW station in Saltillo, Coahuila becomes a SW broadcaster thanks to its third harmonic on 4290, heard M-F mornings with the *Monitor* news magazine from Radio Red network in Mexico City, 1200-1330+. Local IDs occur at odd times, such as 1221 and 1313 from XESHT, R. Joya, 1430. I urge DXers not to try to QSL MW harmonics or contact the station as this could be extremely counterproductive, resulting in elimination of the harmonic (gh, OK)

XERF, 1570, Ciudad Acuña, Coahuila, heard on a weak harmonic 3140 at 1214. ...mentions IMER in IDs, so seems to have been privatized, slogan la Super-Macheca[?] Nortena, but still carries Antena Radio news from IMER at 1300 // XERMX 5985, 9705 and a satellite-delay behind (gh, OK)

NEW ZEALAND RNZI has a budget of only NZ$1.2 million, but the Treasury wants to axe the service. It has a considerable impact in the Pacific despite its sole transmitter compared to the many used by R. Australia and BBC. An unreleased government study in 1996 obtained by Labour Pacific Islands Affairs spokesman Taito Phillip Field said RNZI was not important (*Christchurch Press* via Mark Nicholls, NZ; RA via Dave Alpert) Letters of support for RNZI should go to Hon. Jenny Shipley, Prime Minister, P.O. Box 55, Wellington. Or fax 64-4-473-7045 (RNZI *Mailbox*)

RNZI from Jan greatly reduced usage of 15115, replaced with 17675 after 2200 or so, until 0458 (via Adrian Sainsbury, RNZI)

NIGERIA [non] V. of Free Nigeria, Sat 1900-2000, kept announcing a move to 11645, but stayed on 11715 (Mark Fine, VA, *swltalk*)

NORWAY At least for Jan the experimental 18950 NRK/Denmark broadcast added 1100 to 1000 for SAm but on different azimuths (Olav Mo Grimdalen, NRK, *rec.radio.shortwave* where he posts monthly updates, and via Gigi Lytle)

PAPUA NEW GUINEA For a few days in late Dec, NBC Port Moresby experimented with 11880 and 3925 instead of 9675 and 4890 (Chris Hambly, Australia; Bob Padula, *EDXP*)

PERU R. El Sol de Pucará, reactivated on 5560.6 at 1124-1151, huaynos, frequent IDs (Don Moore, IA)

R. Soledad, Parcoy, on new 4549.5v at 1130, interfering with Bolivia's Rdif. Trópico; plays Andean mainstream huaynos only, adstring every half hour, weak signal but good audio.

R. Nueva Sensación is new station on 4386.5v from Chiclayo at 1115 (Henrik Klemetz, *DLB*) 4390.7 with two booming canned IDs at 1132 (Hans Johnson, FL, *Cumbre DX*)

R. Uno, "la diferente" is new name for R. Gotas de Oro, 4572v since Nov, at 1100 (Henrik Klemetz, Colombia, *Dateline Bogotá*)

R. Ilucán on new 3270.48 at 1038-1104 with ID 1055 (Dave Valko, PA, *Cumbre DX*) Had been on 5629.9 (Don Moore, Ecuador)

R. La Voz de la Huarinja is new on 7003.39 at 0007-0219* to return at 1100; ham CW QRM (Horacio Nigro, Uruguay, *hc-dx*)

PHILIPPINES New sked for *DX Dial* on FEBC: Wed 1420 11995, Sat 0115 15450, Sat 0935 11635 (Peter McIntyre, FEBC, *EDXP*)

POLAND Most PR outlets have rumbles on them as gh noted on 9525 at 1300. I've complained to the station and they try to fix, but are unable to remove the rumble permanently. Also, modulation depth is low, aggravated by absence of any audio compression. Bad condition of Warsaw's over 35 year-old Tesla SW rigs forced them to test relays via Germany (Kai Ludwig, Germany, *Review of International Broadcasting*) PR added 9525 to //6095, 7285 at 2030 English, may help in NAm (Ben McNenly, Ont., *Cumbre DX*) Not a trace of it here (gh, OK)

PORTUGAL RDP to East Timor on new 17710 ex-17595, M-F 1200-1400, Sat/Sun 0800-1000 (*Panlview*, Bulgaria)

ROMANIA Despite RN-Bonaire also on 9590 in English until 0525, RRI has French to Canada from 0500 interfering (George Thurman, TX, gh)

RUSSIA VOR began 1998 by reducing its World Service in English from 24 to 16 hpd, the cuts being 1000-1400 and 2200-0200, the latter during prime NAm time (Ivan Grishin, Ont.; Roger Tidy and Edwin Southwell, UK) We had about two weeks of good reception on 7125 after the buzz was fixed, before the cutback (gh) Albanian, Spanish, Chinese, Polish, Portuguese, Serbo-Croatian, French have also been reduced (VOR DX program via Klaus Lieberwirth, *BC-DX*)

GPR-1 Moscow/Riazan on 15455 around 0800-1200 in Russian produces two very strong symmetrical spurs daily on 15312.11 and 15597.89 (Wolfgang Büschel, Germany, *BC-DX*) The R. Rossii service (Kai Ludwig, *ibid.*)

SAN MARINO [non?] R. San Marino International was accused of being a hoax, actually from Mainz, Germany. In addition to its address in Italy, it did publicize in *Play-DX* an address in Mainz, but this is totally inconclusive, as are claims to broadcast from a mobile transmitter within San Marino. That's the trouble with pirates. Before the mid-January broadcast, its website disappeared. Its before-Xmas broadcasts were widely heard (gh)

RSMI
Radio San Marino International
Shortwave Station from the Republic of San Marino

SARAWAK Many of the listed transmitters of R. Malaysia here are not active; actual monitoring in the local evening confirms after 0930 or 1000: 4895 Kuching Iban service, 5005/6050 Sibu Iban, 5030 Kuching Bidayuh, 6060 Miri Iban relaying Kuching 7270, 7160 Kuching Chinese/English (Bob Padula, *Electronic DX Press*)

SIERRA LEONE FM 98.1 has been interfered with by the Armed Forces Ruling Council, so it added another frequency, 99.9, and plans more FM relays and a SW transmitter (Sierra Leone website via BBCM) My guess is SW would come from Guinea. Much more about this at **http://www.sierra-leone.org/radio1228.html** and ending in **/radio981.html** (Nick Grace, DC, *Cumbre DX*)

SIKKIM AIR Gangtok, 3390, after Hindi had English ID at 1430 giving frequency as 1404 kHz, and western music program (Mahendra Vaghjee, Mauritius)

SLOVAKIA [non] AWR has greatly reduced, but not eliminated usage of Rimavská Sobota transmitters, and increased use of Germany and added satellite via WRN. *Wavescan* is on WRN1 Sundays at 1530; and via AWR-Forli, Italy, 7230 at 0930 and 1230 (Adrian Peterson, AWR)

SOLOMON ISLANDS Just before Xmas, SIBC had an additional frequency, 4960, heard better than //5020, not to be confused with Vanuatu (Rich Hankison, Maui, *Cumbre DX*)

SOMALIA Holy Koran Radio heard on same frequency as V. of Hope, Lebanon, 6549.5, at 1655, 1727-1756*, good signal but weak modulation (Mahendra Vaghjee, Mauritius)

R. Hargeisa, 6866-USB, heard in Dec during period of superb EAf reception, 1851-1927* (Bob Hill, MA, DSWCI *DX Window*)

SUDAN [non] V. of Sudan has some English segments between 0445 and 0500; address is P O Box 4961, Asmara, Eritrea. This and a phone conversation with the only announcer confirm the location (Nick Grace, *Cumbre DX*) No frequency, presumably 7999 (gh) VOS, tentatively from Sa'udi Arabia, 1705 on 12008.0 (Wolfgang Büschel, Germany, *BC-DX*)

SWITZERLAND SRI's main directional site at Schwarzenburg will be closed at the end of March due to environmental concerns, as will the omni at Lenk at the end of October, but Sottens will remain in operation. Because SRI will no longer be able to fulfill its timeswap with CRI, relays via China will end in Oct and shift to Singapore. Transmissions from Switzerland ending as a result of closing Schwarzenburg and Lenk will shift to Germany (Bob Zanotti, SRI, *Review of International Broadcasting*)

[non] The Two Bobs did a one-hour reunion special for Xmas on IRRS, Italy. You may find it in the list of current NEXUS RealAudio offerings at: **http://www.nexus.org/IRN/ra-audio/Nexus-IBA/HELLO_THERE/** (Bob Zanotti, SRI, *Review of International Broadcasting*)

TAIWAN Contrary to previous reports, V. of Free China changed name Jan. 1 to R. Taipei International, at least in the English version (Charlie Crawford, KY; Sonny Ashimori, Japan, *hard-core-dx*) As part of the reorganization of SW broadcasting here, there are now three main networks: RTI in non-Chinese languages, external service; Chinese Dialects Network, for the Mainland, including services previously carried by CBS Network-4 and VOFC; and V. of Asia (Bob Padula, *EDXP*) Actually five, including Variety Network and News Networks in Mandarin (VOA *Communications World*) Mainland authorities promised not to interfere with the reorganized Taipei International Voice (*Chung Yang Jih Pao*, Taiwan via BBCM) Previously subject to intense jamming as CBS services to the Mainland (gh)

TAJIKISTAN Relay facilities here have major technical problems, such as mixing Vatican and R. Free Asia. R. Nederland stopped using it in Dec and moved 5905 at 0030 to Uzbekistan (Andy Sennitt, DSWCI *DX Window*)

TANZANIA During Ramadan (Jan), R. Tanzania Zanzibar, 11734.1, stayed on an hour later until 2100* (Randy Stewart, MO; Mickey Delmage, Manitoba; gh)

TURKEY New host of VOT *Letterbox* is Reshida Morali (Gigi Lytle, TX)

TURKMENISTAN Turkmen Radio 1, presumed, 5015 from 2300 past 0200 around the solstice with beautiful stringed instrumentals (Hans Johnson, FL, *Cumbre DX*)

UKoGBaNI Frank Muir, longtime panelist on BBC's *My Music* and *My Word* died in January (Larry Nebron, CA) BBCWS is now available 24h on Internet: **http://www.audionet.com/bbc/** (via Dave Alpert, NY; William Mederos)

USA Allan Weiner got an FCC construction permit for his SW station in Maine just before Xmas (Anita L. McCormick, *Kiwi Radio Weekly*) see lead story last month (gh) Brother Stair has been offered all the airtime he wants, as much as 75%, in the wake of the *Fury* fiasco. If any is left, station may be called "The Planet" and include DX shows. Target is early 1999 (George Thurman, TX)

WHRA in Maine submitted this sked until March 29, pending FCC approval: 0300-0500 7465 ME, 0500-0800 9400 Af, 1800-2000 17655 Af, 2000-2200 15460 Af, 2200-2400 13760 Af (Joe Brashier, WHR via ODXA via Ivan Grishin)

The FCC URL in Jan issue, p. 40 should have started **http://www.fcc.gov/** (Mark Rodocker)

WRNO, 15420, heard on a Thu at 2100 with *Gilligan's Invitation to the Blues*, from Houma; and at 2200 the syndicated *Blues Story*. Nice to see some original programming on SW (Alan Johnson, NV, *Review of International Broadcasting*)

WHRI replaced 5760 with 5770 at 0400-1000 exc Mon from 0200 (Bob German, GJA, *BC-DX*) Look out, R. Miskut! (gh)

WGTG has received a letter from the FCC exonerating it from all claims of harmful interference made by neighbors. The trouble was really small-town politics trying to ruin our new business. Time on new second transmitter is now available; however, WGTG is for sale at $300K, including two transmitters, five antennas. Or a second station may be built with different calls, secular identity (Dave Frantz, WGTG, *World of Radio*) The 1998 *WRTH* finally got WSHB in the right state on its USA map, but now WGTG almost coincides with Greenville, NC, instead of the GA/TN border (gh) Most WGTG programming is from the Fundamental Broadcasting Network, originating at WOTJ (Winning Others To Jesus), 90.7, Newport, NC which provides a program guide, and audio at **http://www.clis.com/fbn** (via Frantz)

WORLD OF RADIO on WWCR in March resumes 15685 Thu at 2130; other times as of mid-January: Sat 0600 3210 and 5070; Sat 1230 5070; Sun 0730 5070; Tue 1330 15685. When DST resumes first Sunday in April, UT times shift one hour earlier. Check our website for latest info: **http://www.grove.net/~ghauser**

VOA's *Border Crossings* show, M-F 2010-2100, previously on a restricted few frequencies, added 15410 Morocco and 15580 Greenville for better coverage of NAm, Eu, Af (Kim Elliott, VOA and via Edwin Southwell) The huge jazz collection of the late Willis Conover, plus a ton of personal memorabilia, has been donated to the University of North Texas Library, Denton (*Ft Worth Star-Telegram* via Mike Cooper)

On a whim, I checked 25950 for the Portland, OR, pseudo-SW broadcast station at 2125 and there it was on AM with fair signal, rock music, ID as "94-7 NRK" but fading out quickly. 25950 formerly carried KGON and KFXX, but now it's the third station under common ownership, KNRK, actually licensed to Camas, WA (gh, OK) KNRK-FM, 25950 AM, also here for extended daytime periods 1930-0215, fair at best around 2300 (Bryan Clark, NZ, *Cumbre DX*)

MW harmonics: 2340 = 2 x 1170 from WDAT, Amory, MS at 1205-1219, oldies, distorted ID (Don Moore, IA)

2800 = 2 x 1400 from KWLA, Many, LA, pronounced "manny," with many area references, ads and news at 1230, simulcasting KWLV 107.1 (gh, OK)

[non] Tho not specified as such by BBCM, we suspect one WYFR transmission is still a UKOGBANI relay, Arabic at 1800-1900 on 9580 (gh)

[and non] RFA will increase staff from 126 to 224 by mid-year, Mandarin from 5 to 12 hpd, Tibetan from 2 to 4, add Uighur, Cantonese (AFP and AP via *The Australian* via Matt Francis, *EDXP*) As of late Nov, these were the transmitter sites for R. Free Asia; all broadcasts are 60 minutes except Chinese 1500-1630, 1630-1700:

Kamo, ARMENIA: 1130 Lao 17535, 1230 Khmer 11510, 1300 Tibetan 9400, 1400 Vietnamese 9400, 1500 Burmese 9400, 1530 Korean 7475, 2200 Korean 7495, 2200 Lao 7550, 2230 Khmer 11510, 2300 Tibetan 7550, 0030 Burmese 7455.

Dushanbe, TAJIKISTAN: 1130 Lao 15660, 1230 Khmer 7520, 1300 Tibetan 7530, 1400 Vietnamese 6240, 1500 Burmese 6240, 1500 Chinese 7530, 1630 Chinese 7530, 1700 Chinese 7530, 2100 Chinese 7530, 2200 Korean 7530, 2200 Lao 6240, 2230 Khmer 7520, 2300 Chinese 7530, 2300 Tibetan 7415, 2330 Vietnamese 7520, 0030 Burmese 7530.

Almaty, KAZAKHSTAN: 1130 Lao 7540, 1230 Khmer 7540, 1500 Burmese 7540, 2200 Lao 5865, 2230 Khmer 7540, 0030 Burmese 7515.

KWHR, HAWAII: 1230 Khmer 9930 [M-F only -Jim Moats], 1400-1500 Vietnamese 9930.

Holzkirchen, GERMANY: 1300 Tibetan 15385, 2300 Tibetan 9875.

KHBI, SAIPAN: 1400 Vietnamese 9455, 1500 Chinese 11945 and 9445, 1630 Chinese 11945 and 9455, 1700 Chinese 11945, 9455, 2100 Chinese 9795, 9775, 2200 Korean 9455, 2200 Lao 9570, 2300 Chinese 13800, 2330 Vietnamese 13710, 0030 Burmese 13710.

KHBN, PALAU: 1500 Chinese 9910, 1530 Korean 9955, 1630 Chinese 9910, 2100 Chinese 9910, 2200 Lao 9910, 2300 Chinese 9910, 2330 Vietnamese 9980.

Delano, CALIFORNIA: 1500 Chinese 9805, 1630 Chinese 9805, 1700 Chinese 9805, 2100 Chinese 11980, 2200 Korean 11980, 2300 Chinese 11870.

Ulan Bator, MONGOLIA: 1530 Korean 5855, 2200 Korean 7460, 2330 Vietnamese 11580, 0030 Burmese 11580.

KNLS, ALASKA: 2100 Chinese 9650, 2200 Korean 9650, 2300 Chinese 9650 (Shigenori Aoki, Asian Broadcasting Institute, via Jim Moats) RFA subsequently tried to suppress this info (gh)

VENEZUELA Ecos del Torbes missing from 4980, found on 4963, distorted FM at 1045 news, ID (Hans Johnson, FL, *Cumbre DX*)

VIETNAM Cao Bang, 6540.75v with drifting and howling, overmodulated until 1403* (Karl van Rooy, Michiel Schaay, Holland, DSWCI *DX Window*)

Until the Next, Best of DX and 73 de Glenn!

Broadcast Loggings

GLOBAL FORUM

Gayle Van Horn

0007 UTC on 7003.39
PERU: Radio LV de la Guarinja. Spanish. Station ID to "saludos a amigo de Carmen de la Frontera," station ID and greetings to listeners in Huancabamba. *El Candor Pasa* on guitar to correspondence information. National anthem at 0216, 0219*. (Horacio A. Nigro, Montevideo, Uruguay; *Hard Core DX/ Cumbre DX*)

0027 UTC on 4945
PERU: Radio Andina. Lively Spanish sports commentary to station breaks. Peru's **Sudamerica** audible on 5522, 0049-0056 with ID, time checks and Peruvian music. (Mark Veldhuis, Borne, Netherlands/*Hard Core DX*)

0030 UTC on 11660
MADAGASCAR: Radio Netherlands relay. English service to South Asia, monitored to 0125, // 9860. (Lee Silvi, Mentor, OH)

0030 UTC on 5885
GERMANY: Radio Vilnius. Signal drifting to 5885, // 5905. English to North America to 0059, severe utility QRM to 5905. (Silvi, OH; Albert J. Arnold, Chesterfield, VA)

0035 UTC on 5880
LITHUANIA: Radio Vilnius. English service, noted // 5905. Co-channel RTTY interference and QRM from 5875 in Spanish. (Mark J. Fine, Remington, VA; Arnold, VA)

0053 UTC on 6050
CHINA: Xizang PBS. Chinese news and ID as Xizang, did not hear Zhongyang, best in LSB // 4750. (Zacharias Liangas, Thessalloniki, Greece)

0104 UTC on 4879.2
BANGLADESH: Bangla Betar. Presumed news in Bengali, frequent mentions of Bangladesh. ID at 0106, monitored in LSB to avoid number station interference on 4880.(Veldhuis, NLD)

0110 UTC on 4940
SRI LANKA: SLBC. Station address, advertisements, frequency quote to ID. Station noted on 9730 at 0117-0131. *Golden Oldie* music show to program *Back to the Bible.* (Veldhuis, NLD)

0112 UTC on 4870
ECUADOR: Radio Diffusora Cultural. Classroom segment amid utility interference; only moderate QTN noted during local thunderstorms. (Nigro, (URG)

0300 UTC on 3396
ZIMBABWE: ZBC. Drum interval signal to choral national anthem and ID/ frequency quote. Religious programming in regional language. Easy listening music program to Radio Four identification. (R.C. Hewitt, Quartzite, AZ)

0307 UTC on 4935
KENYA: KBC. Station ID including mentions of Nairobi to national news topics. Weather forecast to native music. Commercials to "This is KBC: It's 6:30." (Hewitt, AZ; John D. MacDonald, Poulsbo, WA/*Hard Core DX*)

0340 UTC on 6940
ETHIOPIA:Radio Fana. Presumed this station with males indigenous language and African program format. (Silvi, OH) **Radio Ethiopia** noted on 9704.2, 1557-1601 with text, frequency/ID format and signal chimes. (Veldhuis, NLD)

0359 UTC on 4775
SWAZILAND: TWR. Music box interval signal to station ID. German religious text. (Hewitt, AZ) Religious text on 9500 at 1757-1826; 3240 at 1829-1833. (Veldhuis, NLD)

0650 UTC on 6900
TURKEY: Turkish State Meteo. Typical Turkish vocals and text. Turkey's **Polis Radyosu** noted on 7370 at 0655 with similar format. (Clemente, Italy)

1105 UTC on 5953.8
COSTA RICA: Radio Casino. Fair to poor signal quality for Spanish vocals and regional news items. (Brian Bagwell, St Louis, MO)

1115 UTC on 5005.59
PERU: Radio Jaen. Peruvian flute music amid distorted signal. Excellent catch, not usually noted during random station checks. (Nigro, URG)

1130 UTC on 4890
PAPUA NEW GUINEA: NBC. Regional news item to pop music tune. Brief radio play with signal fades by 1145. (Giampiero Bernrdini, Chieti, Italy/ *Gatflash*!)

1200 UTC on 7285
SOUTH KOREA: KBS/Radio Korea Int'l. English broadcast including *AWR Special,* good signal faded by 1230, plus interference from amateur radio band. (Silvi, OH)

1236 UTC on 9805 LSB
THAILAND: Radio Thailand. Newscast with regional and international headlines. (Wilden, IN) Noted 1448-1510 on 4830. (Walter Mola, Torino, Italy/*Gatflash*!)

1300 UTC on 15220
ANTIGUA: BBC relay. *News Hour* program with a feature on *Amnesty International.* **BBC Cyprus** relay noted on 15565 at 1400. (Wilden, IN)

1338 UTC on 9500
AUSTRALIA: Radio Australia. Chinese/English lesson program. (Wilden, IN). **VL8A** (Alice Springs) on 2310 kHz with time checks, ABC newstune followed by newscast. (Veldhuis, NLD) **Radio Australia** in English from 1300-1445+ on 11660 // 6080, 6020 kHz. (Silvi, OH)

1418 UTC on 7165
NEPAL: Radio Nepal. English news and sports update, followed by Nepalese text to station ID. (Veldhuis, NLD) Station noted on 5005.33 at 1542. (McDonald, *WA;* Bernardini, Italy)

1445 UTC on 4855 LSB
BELARUS: Unid. Relaying Radio Mayak. Music program from Broadway musicals. Report by Irene Lubkacova to tango music at 1458. Station ID as, "Moskovskaya Vremya...program Mayak." (Klaus Elsebusch, Denmark/*Hard Core DX*).

1505 UTC on 4940
RUSSIA: Voice of Russia. English newscast to station ID. Sports briefs to main points round up and *Sunday Panorama* program. (Elsebusch, DNK) *You Write to Us* on 5940 at 2150. (Bob Fraser, Cohasset, MA; Arnold, VA)

1603 UTC on 7120
RWANDA: Deutsche Welle relay. Male speaker with news in English. SINPO=33443. (Veldhuis, NLD)

1615 UTC on 17840
SCENSION ISLANDS: BBC World Service. *Seeing Stars* on the ancients' views of the heavens. (Fraser, MA) **VOA** relay noted on 17755, 2005-2059. (Arnold, VA)

1635 UTC on 11700
GABON: Radio France Int'l relay. Tribute to the late French violinist Stefan Gafelli. (Fraser, MA)

1700 UTC on 15420
USA: WRNO. Rush Limbaugh's show to newscast. **VOA-Greenville** noted on 9455 from 0005-0130. **KVOH** heard on 9975, 0400-0420. (Arnold, VA)

1715 UTC on 9560
ETHIOPIA: Radio Ethiopia. French service including ID, talk and regional music. (Frank Hillton, Charleston, SC)

1845 UTC on 4975
UGANDA: Radio Uganda. Afro pops to classical music. Speech text in regional language. (Liangas, GRC) Station noted on 0410-0417. (Hewitt, AZ; Bernardini, Italy)

1859 UTC on 9780.30
YEMEN: Rep. of Yemen Radio. Regular programming in English, with national anthem, into Arabic programming at 1900. Fair signal for audio level, QRM from carrier on 9780. (Fine, VA; Sarchev, UZB)

1945 UTC on 11715
NIGERIA: Voice of Nigeria. English ID at 1950, with Indiana USA address for QSLs. Station was reportedly to change to 11645 as mentioned in this broadcast, but found on this frequency instead. (Fair, VA) Station noted 1542-1554 on 7255 (Veldhuis, NLD)

2000 UTC on 7580
EURO PIRATE: Radio San Marino Int'l. Station sign-on with multilingual IDs, // 11410 USB fair quality. (Tom Banks, Dallas, TX)

2003 UTC on 4885
BRAZIL: Radio Clube do Para. Early reception of Portuguese broadcast, ID noted as, "Radio Clube." Brazil's **Radio Cancao Nova** noted on 9674, 2033-2100 with ID/frequency quote and address. (Veldhuis, NLD) **Cultura do Para** 5045 at 0130. (Sarychev, UZB)

2020 UTC on 11655
NETHERLANDS: Radio Netherlands. *Media Network* reports on the problems of South Pacific island broadcasters. (Fraser, MA)

2100 UTC on 5020
NIGER: La Voix Du Sahel. French service including highlife music and regional news items. (Sarychev, UZB)

2109 UTC on 4850
CAMEROON: RTV Yaounde. English news at tune-in to wrap up at 2112. Afro music program for French service. (Ross, CAN)

2245 UTC on 7530
BULGARIA: Radio Bulgaria. Economy feature program on exhibition of Bulgarian consumer goods. (Fraser, MA)

2320 UTC on 4925
INDONESIA: RRI-Jambi. Indonesia. Pop music program to Quran. Very good signal considering its 7.5 kW power. Signal faded down after 0010. (Liangas, GRC) **RRI-Sorong** on 4875 at 1350. (Sarychev, UZB)

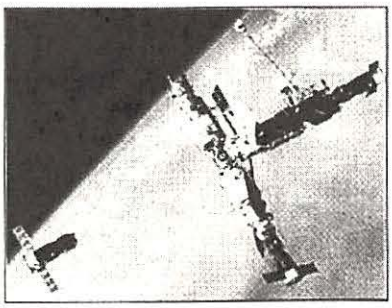
Thanks to our contributors — Have you sent in YOUR logs?
Send to ***Gayle Van Horn,*** *c/o Monitoring Times (or e-mail gayle@grove.net)*
English broadcast unless otherwise noted.

Gayle Van Horn, gayle@grove.net

Out of this World QSL

A favorite activity of many amateur radio operators is to make contact with U.S. hams onboard the *Mir* space station, and you can even get an out-of-this-world QSL for your collection.

Currently, the *Mir* amateur operations can be heard on 145.800 MHz (FM). If you want to try your hand at direct communications with *Mir*, try sending your signal up to the station on 437.850 MHz. *Mir* communications can be easily heard on scanners — even handheld portable scanners.



The graphic above shows the current *Mir* QSL card that is available to amateurs who have successfully made the two-way radio contact with *Mir*, either by FM voice or by packet radio. The QSL is available to stations in North America through Dr. David Larsen, N6CO/K6MIR, or through Sergej Samburov, RV3DR, for stations in the remaining parts of the world.

Send your QSL cards and reception reports to one of the following *Mir* QSL Managers:

Dr. David Larsen, N6CO/K6MIR, P.O. Box 1501, Pine Grove, California 95665 USA. Dave offers confirmation for stations located in the USA, Canada, Australia, New Zealand and South America. Please include a business-sized SASE or IRCs with your QSL or reception report.

Sergej Samburov, RV3DR, P.O. Box 73, Kalinigrad-10 City, Moscow Area, 141070, Russia. Sergej offers confirmation for stations located in Russia only. Please include a self-addressed stamped envelope with your QSL or reception report.

So, the next time you feel like some out of this world communications, try your hand at monitoring and QSLing the Russian *Mir* space station.

Information and graphic for this column are courtesy of John A. Magliacane, KD2BD. John is the amateur satellite columnist for *Satellite Times* magazine and the editor of *SpaceNews*, a weekly publication distributed on the internet for satellite enthusiasts.

BENIN

Radio Diffusion du Benin, 4870 kHz. Partial data QSL card unsigned. Received in six months after one follow up for a French report, SAE (not used for reply) and mint stamps. Station address: La Voix de la Revolution, Boite Postal 366, Cotonou, Benin. (Tom Banks, Dallas, TX)

CUBA

Radio Havana Cuba, 13719 kHz. Card noted as QSL Card # 1 from the Cuba DX Club and nice letter with New Year wishes from Lourdes Lopez, plus pocket calendar, contest entry info sheet, and postcard of *Castle del Morro*. Received in three years for an English report and one U.S. dollar. Station address: Apartado 6240, La Habana, Cuba. (Tony Benbenek, East Hampton, NY)

FM/TV

WROX-FM 96.1 Full data verification letter signed by Dave Morgan-News Director; my prepared QSL card was returned. Received for an English FM report and SASE. Station address: 500 Dominion Tower, 999 Waterside Dr., Norfolk, VA 23510. (Hank Holbrook, Dunkirk, MD)

WKRY-FM 93.6 Full data verification letter signed by Sherry Russo-General Manager. Received in 13 months for an English FM report and SASE. Station address: 3820 North Roosevelt Blvd., Key West, FL 33040. (Holbrook, MD)

KLQP-FM 92.1 Full data verification letter signed by Maynard R. Meyer-General Manager/Chief Engineer. Received in ten days for an English FM report and SASE. Station address: Box 70, Madison, MN 56256. (Holbrook, MD)

WBUF-LP TV Buffalo, NY Ch. 39. Full data prepared QSL card and personal letter from Caroline K. Powley-Owner. Received in 3 weeks for a TV reception report and mint stamps. Station address: 9276 Dutch Hill Rd., West Valley, NY 14171. WNGS and WBUF-LP simulcast and are owned by the same person. (Robert S. Ross, London, Ontario, Canada/*amfmtvdx*)

CIII-TV 55 Fort Erie, Ontario, Ch. 55. Full data prepared QSL card signed only as Asst. Director of Engineering , plus station license and coverage map. Received in three weeks for a TV reception report and mint stamps. Station address: c/o Global Communications, 81 Barber Greene Rd., Don Mills, Ontario M3C 2A2 Canada. (Ross, CAN)

WSTR-TV 64 Cincinnati, OH. Full data prepared QSL card and personal letter from Greg Buzzell-Chief Engineer. Souvenir station "goodie" box included the following; two WSTR cups, two station rulers, and three station T-shirts. Best QSL package ever received...it cost them $7.00 just to ship to me. Received in one month for a TV reception report and mint stamps (returned). Station address: 5177 Fishwick Dr., Cincinnati, OH 45216. (Ross, CAN)

JORDAN

Radio Jordan, 11690 kHz. Two full data QSL cards signed by Jawad Zada-Director. Received for a taped "period" report of two days reception and two IRCs. Station address: P.O. Box 909, Amman, Jordan. (Randy Stewart, Springfield, MO)

MEDIUM WAVE

KGXL-AM 1650 Costa Mesa, CA. Full data hand written verification letter, signed by Tom White-Director of Engineering plus business card. Received in 13 days for an English AM report. Station address: 1500 Cotner Ave., Los Angeles, CA 90025. (Patrick M. Griffith, Federal Heights, CO)

PAKISTAN

Radio Pakistan, 5055 kHz. Partial data card of *Mount Rakaposhi*, signed by Anwer Inayet Khan-Engineering Manager, plus personal note from the veri signer. I was quite surprised to receive this verification on this frequency, and for this service. I have sent numerous reports for their English transmission on 11570 to no avail. Received in 30 days after one follow up for an English report and SASE. Station address:P.O. Box 1393, Islamabad 44000, Pakistan. (Steve Martin, CA/*Cumbre DX*)

USA

Rehoboth Bay Marina, 156.8 MHz. Full data prepared QSL card signed by Capt. Larry Karipinski-Harbor Master, plus photo of the marina. Received for an English report and mint stamps. Station address: 1117 Highway One, Dewey Beach, DE 19971. (Holbrook, MD)

KDT386 Delaware Dept. of Transportation, 1390 kHz. Full data verification letter signed by Carl Shulak-Highway Engineer/Planning Technician. Received for an English report and mint stamps. Station address: c/o Bureau of Traffic, 250 Bear Christiana Rd., Bear, DE 19701. (Holbrook, MD)

How to Use the Shortwave Guide

1: Convert your time to UTC.

Eastern and Pacific Times are already converted to Coordinated Universal Time (UTC) at the top of each page. The rule is: convert your local time to 24-hour format; add (during Standard Time) 5,6,7, or 8 hours for Eastern, Central, Mountain or Pacific Times, respectively.

Note that all dates, as well as times, are in UTC; for example, a show which might air at 0030 UTC Sunday will be heard on Saturday evening in America (7:30 pm Eastern, 4:30 pm Pacific).

2: Choose a program or station you want to hear.

Some selected programs appear on the lower half of the page for prime listening hours—space does not permit 24-hour listings.

Occasionally program listings will be followed by "See X 0000." This information indicates that the program is a rerun, and refers to a previous summary of the program's content. The letter stands for a day of the week, as indicated below, and the four digits represent a time in UTC.

S: Sunday T: Tuesday H: Thursday A: Saturday
M: Monday W: Wednesday F: Friday

3: Find the frequencies for the program or station you want to hear.

Look at the page which corresponds to the time you will be listening. Comprehensive frequency information for English broadcasts can be found at the top half of the page. All frequencies are in kHz.

The frequency listing uses the same day codes as the program listings; if a broadcast is not daily, those day codes will appear before the station name. Irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

4: Choose the most promising frequencies for the time, location and conditions.

Not all stations can be heard and none all the time on all frequencies. To help you find the most promising frequency, we've included information on the target area of each broadcast. Frequencies beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible. Every frequency is followed by one of these target codes:

am:	The Americas	as:	Asia
na:	North America	au:	Australia
ca:	Central America	pa:	Pacific
sa:	South America	va:	various
eu:	Europe	do:	domestic broadcast
af:	Africa	om:	omnidirectional
me:	Middle East		

Consult the propagation charts. To further help you find the right frequency, we've included charts at the back of this section which take into account conditions affecting the audibility of shortwave broadcasts. Simply pick out the region in which you live and find the chart for the region in which the station you want to hear is located. The chart indicates the optimum frequencies for a given time in UTC.

Hot News

Compiled by Jim Frimmel

BBC. The World Service got in step with other major broadcasters with a live full-time presence on the Internet via a partnership with AudioNet. Both 28.8 and 14.4 RealAudio streams are offered (**www.audionet.com/bbc/**).

SELECTED PROGRAMS. Featured broadcasters this month include China Radio International (CRI), Radio Netherlands, and Voice of Russia (VOR).

CHINA. One of the world's largest broadcasters, China Radio International, finally has a presence on the internet (**www.cri.cngb.com**), but it is still under construction as of this report. CRI now featuring "Voices from Other Lands" on Tuesdays, a cultural program about the world and its people. Listeners in the Washington, D.C. area can now hear CRI in English on WUST (1120 AM) from 9:00-10:00, M-F.

MEXICO. Another newcomer to the internet is Radio Mexico International (**www.telecommex.com/imer/rmi.html**) with a nice program grid.

RUSSIA. The Voice of Russia revamped its program lineup on Jan 1st when it cut back its English broadcasts from 24 to 16 hours a day. Despite VoR's changes, the station became increasingly difficult to hear, resulting in a call for reception reports during January.

USA (VOA). In an unusual departure from established custom, VOA's Africa Service is now transmitting news followed by *Border Crossings* at 2000 daily on frequencies 15410 and 15580 while all other frequencies carry the second repeat of *Africa World Tonight*. (Thanks to Bill Whitacre of VOA whose advice is to "sit back and enjoy the music.")

TALK TO AMERICA. Now in its 40th month on the air, the Voice of America's superb call-in program continues to be a favorite to listeners around the world. It is now heard on local AM, FM, and cable systems in 26 countries in addition to all VOA shortwave frequencies at 1700 UTC. If you missed a broadcast, don't despair. You can hear the previous broadcast via the Internet (**www.voa.gov/programs/audio/realaudio/**). Unfortunately, VOA does not archive and index earlier broadcasts of these excellent programs.

WEBCASTING NEWS. The popular search engine "Yahoo!" teamed up with AudioNet to become a premier distributor for AudioNet's broadcasts. RealNetworks announced the launch of RealPlanet (**www.realplanet.com**), a guide to international RealAudio and RealVideo programming on the Web. Major webcasting providers have joined forces to protest proposed regulations which would require payment of royalty fees for transmission of copyright audio over the internet.

OLD TIME RADIO REVISITED. Some months ago we mentioned that CBS was providing the old *Mystery Theater* program on its website (**www.cbsradio.com/mystery/default.html**). Bookmark these other sites for additional listening trips to yesteryear: (**www.scifi.com/pulp/set/set_classics.html**) (**otr.uwsp.edu/HearNow.htm**) (**www.mead.net/airtime/onair.html**). (Thanks to Ed Sherwood!)

WAVEGUIDE UPDATE. If you're not one of the over 145 WaveGuide subscribers, send E-mail to *frimmel@startext.net* to get on the electronic mailing list for a file of shortwave broadcasts audible in North America. You can import it to your database or word processing program or, if you're a Mac user, import it to WaveMaster, a free program available at (**www.crosslink.net/~mfine/**).

0000 UTC SHORTWAVE GUIDE 7:00 PM EST 4:00 PM PST

Frequencies

0000-0100	Anguilla,Caribbean Beacon	6090am			
0000-0100	Australia, Radio	9660pa	12080pa	13605pa	13755pa
		15510pa	17750as	17795pa	
0000-0100 vl	Australia, VL8K Katherine	5025do			
0000-0100 vl	Australia, VL8T Tent Crk	4910do			
0000-0100	Bulgaria, Radio	7375na	9485na		
0000-0015	Cambodia, Natl Voice of	11940as			
0000-0100	Canada, CBC N Quebec Svc	9625do			
0000-0100	Canada, CFRX Toronto	6070do			
0000-0100	Canada, CFVP Calgary	6030do			
0000-0100	Canada, CHNX Halifax	6130do			
0000-0100	Canada, CKZN St John's	6160do			
0000-0100	Canada, CKZU Vancouver	6160do			
0000-0029	Canada, R Canada Intl	5960na	6040na	9535na	9755na
		11865am			
0000-0027	Czech Rep, Radio Prague	5930na	7345na		
0000-0100	Ecuador, HCJB	9745am	21455am		
0000-0030	Egypt, Radio Cairo	9900na			
0000-0100	Germany,Overcomer Ministr	5840na			
0000-0015 vl	Ghana, Ghana Broadc Corp	3366do	4915do		
0000-0045	India, All India Radio	4920as	5010as	7410as	9705as
		9950as	11620as		
0000-0100	Japan, R Japan/NHK World	6155eu	6180eu		
0000-0030	Japan, R Japan/NHK World	13630as	13650as		
0000-0100	Liberia,LCN/R Liberia Int	5100do			
0000-0100	Malaysia, Radio	7295do			
0000-0100	Malaysia, RTM Kuching	7160do			
0000-0030	Netherlands, Radio	6020na	6165na		
0000-0100	New Zealand, R NZ Intl	17675pa			
0000-0100	North Korea, R Pyongyang	11845na	13650na	15230na	
0000-0100 vl	Papua New Guinea, NBC	9675do			
0000-0100	Singapore, SBC Radio One	6160do			
0000-0100 vl	Solomon Islands, SIBC	5020do			
0000-0100	Spain, R Exterior Espana	6055am			
0000-0030	Thailand, Radio	9655af	9680af	11905af	
0000-0030	UK, BBC Asian Service	3915as	6195as	7110as	9410as
		9580as	11945as	11955as	15280as
		15310as	15360as		
0000-0100	UK, BBC World Service	5970sa	5975am	6175na	9590am
		9915sa	11750sa		
0000-0100	USA, KAIJ Dallas TX	5810am			
0000-0059	USA, KHBI N Mariana Is	15665as			
0000-0100	USA, KTBN Salt Lk City UT	7510am			
0000-0100	USA, KWHR Naalehu HI	7560as	17510as	17555pa	
0000-0100	USA, Voice of America	7215as	9890as	11760as	15185as
		15290as	17735as	17820as	
0000-0030 twhfa	USA, Voice of America	5995am	6130ca	7405am	9455am
		9775am	11695am	13740am	
0000-0100	USA, WEWN Birmingham AL	5825eu			
0000-0100	USA, WGTG McCaysville GA	5085am			
0000-0100	USA, WHRI Noblesville IN	5745am	7315am		
0000-0100	USA, WINB Red Lion PA	11950am			
0000-0100	USA, WJCR Upton KY	7490na			
0000-0100 twhfa	USA, WRMI/R Miami Intl	9955am			
0000-0030 a	USA, WRMI/R Miami Intl	9955am			
0000-0100	USA, WRNO New Orleans LA	7355am			
0000-0059 mwf	USA, WSHB Cypress Crk SC	9430am			
0000-0059 smwfa	USA, WSHB Cypress Crk SC	7535na			
0000-0100	USA, WWCR Nashville TN	5070am	5935am	7435am	
0000-0100	USA, WYFR Okeechobee FL	6085na	9505ca		
0029-0059	Canada, R Canada Intl	5960na	9755na		
0030-0100	Iran, VOIRI	6050eu	9022eu	9685eu	
0030-0100	Lithuania, Radio Vilnius	5880na	5905na		
0030-0100	Netherlands, Radio	5905as	6020na	6165na	7305as
		9860as	11660as		
0030-0100	Sri Lanka, Sri Lanka BC	9730as	15425as		
0030-0100	Thailand, Radio	9655as	13695na	15395as	
0030-0100	UK, BBC Asian Service	5965as	6080as	6195as	9410as
		11955as	15310as	15360as	
0050-0100	Italy, RAI Intl	6010na	9675na	11800na	

Selected Programs

Sundays

0000 Herald Broadcasting (KHBI #2/WSHB #2): Bible Lesson. Lesson-sermons from the King James Version of the Bible and Mary Baker Eddy's textbook.
0025 Netherlands, Radio: Insight. Rob Green looks at what made the news in the past seven days.
0028 Herald Broadcasting (KHBI #2/WSHB #2): The Christian Science Sentinel. Discussions on how the Bible addresses the trends of thought of today.
0030 Netherlands, Radio: News. Bulletin of world news at the start of all programs.
0038 Netherlands, Radio: Newsline. Correspondent reports, interviews, and commentaries on current events.
0053 Netherlands, Radio: Weekend. Maggie Ayre joins colleagues from BBC World Service, Radio France International and Deutsche Welle for a weekly look at issues and themes important throughout Europe.

Mondays

0000 Herald Broadcasting (KHBI #1&2/WSHB #1): Sunday Service from the Mother Church. See S 2300.
0030 Netherlands, Radio: News. See S 0030.
0035 Netherlands, Radio: Sincerely Yours. See S 1138.
0053 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

0000 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
0025 Netherlands, Radio: Press Review. See M 1225.
0028 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
0030 Netherlands, Radio: News. See S 0030.
0038 Netherlands, Radio: Newsline. See S 0038.
0053 Netherlands, Radio: Research File. See M 1153.

Wednesdays

0000 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
0000 Herald Broadcasting (WSHB #1&2): The Christian Science Sentinel. See S 0028.
0025 Netherlands, Radio: Press Review. See M 1225.
0028 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
0028 Herald Broadcasting (WSHB #1&2): Bible Lesson. See S 0000.
0030 Netherlands, Radio: News. See S 0030.
0040 Netherlands, Radio: Newsline. See S 0038.
0053 Netherlands, Radio: State of the Arts. See T 1153.

Thursdays

0000 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
0025 Netherlands, Radio: Press Review. See M 1225.
0028 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
0030 Netherlands, Radio: News. See S 0030.
0038 Netherlands, Radio: Newsline. See S 0038.
0054 Radio Netherlands: Documentary. Belgium (26th). See F 2354.
0054 Radio Netherlands: Documentary. The Dutch Seaborne Empire (19th). See H 1454.
0054 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (5th). See W 1154.
0054 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (12th). See A 0154.

Fridays

0000 Herald Broadcasting (KHBI #2/WSHB #1): Bible Lesson. See S 0000.
0000 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
0025 Netherlands, Radio: Press Review. See M 1225.
0028 Herald Broadcasting (KHBI #2/WSHB #1): The Christian Science Sentinel. See S 0028.
0030 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
0030 Netherlands, Radio: News. See S 0030.
0038 Netherlands, Radio: Newsline. See S 0038.
0053 Netherlands, Radio: Media Network. See H 1153.

Saturdays

0000 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
0000 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
0025 Netherlands, Radio: Press Review. See M 1225.
0028 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
0028 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
0030 Netherlands, Radio: News. See S 0030.
0038 Netherlands, Radio: Newsline. See S 0038.
0053 Netherlands, Radio: A Good Life. See M 1253.

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Thank You...

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Frequencies

0100-0200	Anguilla,Caribbean Beacon	6090am			
0100-0200	Australia, Radio	9660pa	12080pa	13605pa	13755pa
		15240pa	15415as	15510pa	17750pa
		17795pa			
0100-0200 vl	Australia, VL8K Katherine	5025do			
0100-0200 vl	Australia, VL8T Tent Crk	4910do			
0100-0200	Canada, CBC N Quebec Svc	9625do			
0100-0200	Canada, CFRX Toronto	6070do			
0100-0200	Canada, CFVP Calgary	6030do			
0100-0200	Canada, CHNX Halifax	6130do			
0100-0200	Canada, CKZN St John's	6160do			
0100-0200	Canada, CKZU Vancouver	6160do			
0100-0200	Costa Rica,RF Peace Intl	6980am	7385am		
0100-0200	Cuba, Radio Havana	6000na	9820na	9830na	
0100-0127	Czech Rep, Radio Prague	6200na	7345na		
0100-0200	Ecuador, HCJB	9745am	21455am		
0100-0150	Germany, Deutsche Welle	5960na	6040na	6085na	6145na
		9640na			
0100-0200	Germany,Overcomer Ministr	5840na			
0100-0115	Ghana, Ghana Broadc Corp	3366do	4915do		
0100-0200	Indonesia, Voice of	11785as			
0100-0130	Iran, VOIRI	9022eu	9585eu	9685eu	
0100-0110	Italy, RAI Intl	6010na	9675na	11800na	
0100-0200	Japan, R Japan/NHK World	11790na	11860as	11890as	13630na
		15570as	15590as	17810as	21610pa
0100-0200	Liberia,LCN/R Liberia Int	5100do			
0100-0200 smtwh	Malaysia, Radio	7295do			
0100-0125	Netherlands, Radio	5905as	6020na	6165na	7305as
		9860as	11660as		
0100-0200	New Zealand, R NZ Intl	17675pa			
0100-0130 m	Norway, Radio Norway Intl	7465na	7545am		
0100-0200 vl	Papua New Guinea, NBC	9675do			
0100-0200	Philippines, FEBC/R Intl	15450as			
0100-0130 mtwhfa	Serbia, Radio Yugoslavia	6195na	7115na		
0100-0200	Singapore, SBC Radio One	6160do			
0100-0130	Slovakia, R Slovakia Intl	5930na	7300af	9440sa	
0100-0200 vl	Solomon Islands, SIBC	5020do			
0100-0200	Spain, R Exterior Espana	6055am			
0100-0200	Sri Lanka, Sri Lanka BC	9730as	15425as		
0100-0130	Switzerland, Swiss R Intl	6135na	9885na	9905ca	
0100-0200	UK, BBC Asian Service	5965as	6195as	9410as	11955as
		15280as	15310as	15360as	
0100-0200	UK, BBC World Service	5970sa	5975am	6175na	9590am
		9915sa	11750sa		
0100-0200	Ukraine, R Ukraine Intl	5915na	5940eu	6020eu	6050eu
		6080eu	7150na	7205na	7290eu
		7420eu	9560eu		
0100-0200	USA, KAIJ Dallas TX	5810am			
0100-0200	USA, KTBN Salt Lk City UT	7510am			
0100-0200	USA, KWHR Naalehu HI	7560as	17510as	17555pa	
0100-0200	USA, Voice of America	7115as	7205as	9740as	9850as
		11705as	15250as	15300as	17740as
		17820as			
0100-0200 twhfa	USA, Voice of America	5995am	6130am	7405am	9445am
		9775am	13740am		
0100-0200	USA, WEWN Birmingham AL	5825eu			
0100-0200	USA, WGTG McCaysville GA	5085am			
0100-0200	USA, WHRI Noblesville IN	5745am	7315am		
0100-0200	USA, WINB Red Lion PA	11950am			
0100-0200	USA, WJCR Upton KY	7490na			
0100-0200 twhfa	USA, WRMI/R Miami Intl	9955am			
0100-0200	USA, WRNO New Orleans LA	7355am			
0100-0159 m	USA, WSHB Cypress Crk SC	9430am			
0100-0159	USA, WSHB Cypress Crk SC	7535na			
0100-0200	USA, WWCR Nashville TN	3215am	5070am	5935am	7435am
0100-0200	USA, WYFR Okeechobee FL	6065na	9505na	11550as	
0100-0130	Uzbekistan, R Tashkent	5955eu	5975eu	9540eu	
0100-0127	Vietnam, Voice of	5940na			
0115-0200 m	USA, WRMI/R Miami Intl	9955am			
0125-0200	Netherlands, Radio	9860as	11655as		
0130-0200	Austria, R Austria Intl	7325na	9495am	9870am	
0130-0150	Greece, Voice of	5895na	6260na	7450na	9425na
0130-0200	Guam, AWR/KSDA	17645as			
0130-0200	Sweden, Radio	7265as			
0140-0200	Vatican State, Vatican R	5980au	7335au	9650au	

Selected Programs

Sundays

0100 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0128 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0130 Greece, Voice of: News. World news in English.
0130 Netherlands, Radio: News. See S 0030.
0138 Netherlands, Radio: Newsline. See S 0038.
0140 Vatican State, Vatican Radio: Liturgical Reflection. Discussion of a topic from church liturgy.
0152 Vatican State, Vatican Radio: News. A bulletin of international news.
0153 Netherlands, Radio: Roughly Speaking. An upbeat magazine program for European youth.

Mondays

0100 Herald Broadcasting (WSHB #1&2): Sunday Service from the Mother Church. See S 2300.
0125 Netherlands, Radio: Program Info. Summary of upcoming program schedules.
0130 Greece, Voice of: News. See S 0130.
0130 Netherlands, Radio: News. See S 0030.
0136 Netherlands, Radio: Wide Angle. See S 1238.
0140 Vatican State, Vatican Radio: Focus on the Church. News about the church in the region and around the world.
0145 UK, BBC London (AE): Images of Britain (2nd,9th,16th). Larry Harris talks to journalists from many parts of the world who are based in the UK to find out what they are writing about.
0150 Vatican State, Vatican Radio: The Backgrounder. Weekly interview program.
0152 Vatican State, Vatican Radio: News. See S 0152.
0154 Netherlands, Radio: Siren Song. See S 1254.

Tuesdays

0100 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0125 Netherlands, Radio: Program Info. See M 0125.
0130 Greece, Voice of: News. See S 0130.
0130 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0130 Netherlands, Radio: News. See S 0030.
0138 Netherlands, Radio: Newsline. See S 0038.
0140 Vatican State, Vatican Radio: Focus on the Church. See M 0140.
0145 UK, BBC London (AE): Just a Taste (3rd,10th,17th). Katharine Hodgson, host of the World Service's cookery program, prepares a different dish each week (recipes available upon request).
0152 Vatican State, Vatican Radio: News. See S 0152.
0153 Netherlands, Radio: A Good Life. See M 1253.

Wednesdays

0100 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0125 Netherlands, Radio: Program Info. See M 0125.
0128 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0130 Greece, Voice of: News. See S 0130.
0130 Netherlands, Radio: News. See S 0030.
0138 Netherlands, Radio: Newsline. See S 0038.
0152 Vatican State, Vatican Radio: News. See S 0152.
0154 Netherlands, Radio: Music 52-15. See T 1253.

Thursdays

0100 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0125 Netherlands, Radio: Program Info. See M 0125.
0130 Greece, Voice of: News. See S 0130.
0130 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0130 Netherlands, Radio: News. See S 0030.
0138 Netherlands, Radio: Newsline. See S 0038.
0140 Vatican State, Vatican Radio: News of the Church. News of the Catholic Church in the Vatican and around the world.
0145 Vatican State, Vatican Radio: Mailbox. Letters from listeners are read on-the-air and frequency changes are announced when planned.
0152 Vatican State, Vatican Radio: News. See S 0152.
0153 Netherlands, Radio: Sounds Interesting. See S 1153.

Fridays

0100 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0125 Netherlands, Radio: Program Info. See M 0125.
0128 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0130 Greece, Voice of: News. See S 0130.
0130 Netherlands, Radio: News. See S 0030.
0138 Netherlands, Radio: Newsline. See S 0038.
0152 Vatican State, Vatican Radio: News. See S 0152.
0153 Netherlands, Radio: Research File. See M 1153.

Saturdays

0100 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0125 Netherlands, Radio: Program Info. See M 0125.
0130 Greece, Voice of: News. See S 0130.
0130 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0130 Netherlands, Radio: News. See S 0030.
0130 UK, BBC London (AE): Counterpoint. Britain's music-buffs compete once again in this general knowledge music quiz.
0138 Netherlands, Radio: Newsline. See S 0038.
0140 Vatican State, Vatican Radio: News from the African Church. Activities of the Catholic Church in Africa.
0152 Vatican State, Vatican Radio: News. See S 0152.
0154 Radio Netherlands: Documentary. Belgium (28th). See F 2354.
0154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (21st). See H 1454.
0154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (7th). See W 1154.
0154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (14th). Part three of the four-part series.

0200 UTC SHORTWAVE GUIDE 9:00 PM EST 6:00 PM PST

Frequencies

0200-0300	Anguilla,Caribbean Beacon	6090am			
0200-0300 twhfa	Argentina, RAE	11710am			
0200-0300	Australia, Radio	9660pa	12080pa	13605pa	15240pa
		15415as	15510pa	17750as	17795pa
0200-0300 vl	Australia, VL8K Katherine	5025do			
0200-0300 vl	Australia, VL8T Tent Crk	4910do			
0200-0210	Bangladesh, Bangla Betar	4880do			
0200-0300	Canada, CBC N Quebec Svc	9625do			
0200-0300	Canada, CFRX Toronto	6070do			
0200-0300	Canada, CFVP Calgary	6030do			
0200-0300	Canada, CHNX Halifax	6130do			
0200-0300	Canada, CKZN St John's	6160do			
0200-0300	Canada, CKZU Vancouver	6160do			
0200-0259	Canada, R Canada Intl	6155am	9535am	9755am	9780am
		11865am			
0200-0300	Costa Rica,RF Peace Intl	6980am	7385am		
0200-0300	Cuba, Radio Havana	6000na	9820na	9830na	
0200-0300	Ecuador, HCJB	9745am	21455am		
0200-0300	Egypt, Radio Cairo	9475na			
0200-0250	Germany, Deutsche Welle	6035as	7160as	7285as	7355as
		9515as	9615as	9815as	
0200-0300	Germany,Overcomer Ministr	5880na	7335na		
0200-0300 vl	Honduras, LV Evangelica	4820am			
0200-0230	Hungary, Radio Budapest	6030na	9580na		
0200-0300 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0200-0300 smtwh	Malaysia, Radio	7295do			
0200-0300 s	Malta, VO Mediterranean	15550au	17570as		
0200-0300	Netherlands, Radio	9860as	11660as		
0200-0300	New Zealand, R NZ Intl	17675pa			
0200-0230 m	Norway, Radio Norway Intl	7565am			
0200-0300 vl	Papua New Guinea, NBC	9675do			
0200-0300	Philippines, FEBC/R Intl	15450as			
0200-0256	Romania, R Romania Intl	6155na	7195na	9510na	9570na
		9690as	11940na		
0200-0300	Russia,Voice of Russia WS	5930na	7105na	7345na	9580na
		12030na	13665na		
0200-0300 mtwhfa	Russia,Voice of Russia WS	5920na			
0200-0230	Serbia, Radio Yugoslavia	6180na	7130na		
0200-0300	Singapore, SBC Radio One	6160do			
0200-0300 vl	Solomon Islands, SIBC	5020do			
0200-0300	South Korea, R Korea Intl	7275as	11725am	11810am	15575am
0200-0300	Sri Lanka, Sri Lanka BC	9730as	15425as		
0200-0300	Taiwan, Taipei Radio Intl	5950na	7130as	9680na	11740am
		11825pa	15345as		
0200-0300	UK, BBC African Service	6050af	6135af	7125af	9610af
0200-0300	UK, BBC Asian Service	9410as	9605as	9825as	11760as
		11955as	15280as	15310as	15360as
		15405as			
0200-0230	UK, BBC World Service	5970sa	5975am	6175na	9590am
		9915sa			
0200-0300	USA, KAIJ Dallas TX	5810am			
0200-0300	USA, KTBN Salt Lk City UT	7510am			
0200-0300	USA, KWHR Naalehu HI	7560pa	17510as	17555pa	
0200-0300	USA, Voice of America	7115as	7205as	9740as	9850as
		11705as	15250as	15300as	17740as
		17820as			
0200-0300	USA, WEWN Birmingham AL	5825eu			
0200-0300	USA, WGTG McCaysville GA	5085am			
0200-0300 s twhfa	USA, WHRI Noblesville IN	5745am			
0200-0300 m	USA, WHRI Noblesville IN	5770am			
0200-0300	USA, WHRI Noblesville IN	7315am			
0200-0300	USA, WINB Red Lion PA	11950am			
0200-0300	USA, WJCR Upton KY	7490na			
0200-0300 mtwhfa	USA, WRMI/R Miami Intl	9955am			
0200-0300	USA, WRNO New Orleans LA	7355am			
0200-0259 m	USA, WSHB Cypress Crk SC	5850na			
0200-0259 mh	USA, WSHB Cypress Crk SC	7535na			
0200-0300	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0200-0300	USA, WYFR Okeechobee FL	6065na	9505na		
0215-0220	Nepal, Radio	3230do	5005do		
0230-0245	Pakistan, Radio	7485as	11760as	13620as	15485as
0230-0300	Sweden, Radio	7280na			
0230-0300	UK, BBC World Service	5970sa	5975am	6175na	7325sa
		9895am			
0230-0300 vl	Zambia, R Zambia/ZNBC 2	6165do			
0245-0300	Albania, R Tirana Intl	6115na	7160na		
0245-0300	UK, BBC World Service	5995am	6110am	6190ca	9515am
0250-0300 sf	Greece, Voice of	5895na	6260na	7450na	9425na
0250-0300	Vatican State, Vatican R	6095am	7305ca		
0255-0300 vl	Zambia, R Zambia/ZNBC 1	4910do			

Selected Programs

Sundays

0200 Russia, Voice of: News. Every hour on the hour.
0211 Russia, Voice of: Music and Musicians. World-famous performers and composers play for you.
0230 Netherlands, Radio: News. See S 0030.
0238 Netherlands, Radio: Newsline. See S 0038.
0245 UK, BBC London (AS): Just a Taste (1st,8th,15th). See T 0145.
0253 Netherlands, Radio: Weekend. See S 0053.

Mondays

0200 Herald Broadcasting (WSHB #1): Sunday Service from the Mother Church. See S 2300.
0200 Herald Broadcasting (WSHB #2): Sunday Service from the Mother Church. See S 2300.
0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Music and Musicians. See S 0211.
0225 Netherlands, Radio: Program Info. See M 0125.
0230 Netherlands, Radio: News. See S 0030.
0236 Netherlands, Radio: Sincerely Yours. See S 1138.
0253 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Commonwealth Update. Comments on the latest developments in the CIS, in-depth analysis of current events, and major issues of home policies.
0225 Netherlands, Radio: Program Info. See M 0125.
0230 Netherlands, Radio: News. See S 0030.
0230 Russia, Voice of: News in Brief. See S 0330.
0230 UK, BBC London (AF): Just a Taste (3rd,10th,17th). See T 0145.
0232 Russia, Voice of: Folk Box. See M 1532.
0238 Netherlands, Radio: Newsline. See S 0038.
0253 Netherlands, Radio: Research File. See M 1153.

Wednesdays

0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Commonwealth Update. See T 0211.
0225 Netherlands, Radio: Program Info. See M 0125.
0230 Netherlands, Radio: News. See S 0030.
0230 Russia, Voice of: News in Brief. See S 0330.
0232 Russia, Voice of: Yours for the Asking. See T 0532.
0238 Netherlands, Radio: Newsline. See S 0038.
0253 Netherlands, Radio: State of the Arts. See T 1153.

Thursdays

0200 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Commonwealth Update. See T 0211.
0225 Netherlands, Radio: Program Info. See M 0125.
0230 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
0230 Netherlands, Radio: News. See S 0030.
0230 Russia, Voice of: News in Brief. See S 0330.
0232 Russia, Voice of: The Jazz Show. See M 0532.
0238 Netherlands, Radio: Newsline. See S 0038.
0254 Radio Netherlands: Documentary. Belgium (26th). See F 2354.
0254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (19th). See H 1454.
0254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (5th). See W 1154.
0254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (12th). See A 0154.

Fridays

0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Commonwealth Update. See T 0211.
0225 Netherlands, Radio: Program Info. See M 0125.
0230 Netherlands, Radio: News. See S 0030.
0230 Russia, Voice of: News in Brief. See S 0330.
0232 Russia, Voice of: Music at Your Request. See T 1532.
0238 Netherlands, Radio: Newsline. See S 0038.
0253 Netherlands, Radio: Media Network. See H 1153.

Saturdays

0200 Russia, Voice of: News. See S 0200.
0211 Russia, Voice of: Commonwealth Update. See T 0211.
0225 Netherlands, Radio: Insight. See S 0025.
0230 Netherlands, Radio: News. See S 0030.
0230 Russia, Voice of: News in Brief. See S 0330.
0232 Russia, Voice of: The Jazz Show. See M 0532.
0238 Netherlands, Radio: Newsline. See S 0038.
0253 Netherlands, Radio: A Good Life. See M 1253.

Hauser's Highlights
Georgia: Georgian Radio

Programme Georgia monitored in English, but erratic:

0630-0700	11805 kHz
0830-0900	11910
0930-1000	11910
1630-1700	6080
1730-1800	6080
1830-1900	6230
1930-2000	6230
(BBCM)	

Frequencies

0300-0400	Anguilla,Caribbean Beacon	6090am			
0300-0400	Australia, Radio	9660pa	12080pa	13605pa	15240pa
		15415as	15510pa	17750pa	17795pa
0300-0400 vl	Australia, VL8K Katherine	5025do			
0300-0400 vl	Australia, VL8T Tent Crk	4910do			
0300-0330 mtwhf	Canada, Can Forces Net	6155ca	9755ca	9780ca	
0300-0400 vl	Canada, CBC N Quebec Svc	9625do			
0300-0400	Canada, CFRX Toronto	6070do			
0300-0400	Canada, CFVP Calgary	6030do			
0300-0400	Canada, CHNX Halifax	6130do			
0300-0400	Canada, CKZN St John's	6160do			
0300-0400	Canada, CKZU Vancouver	6160do			
0300-0359 twhfa	Canada, R Canada Intl	6155am	9755am	9780am	
0300-0329	Canada, R Canada Intl	6155am	9755am	9780am	
0300-0400	China, China Radio Intl	9690na			
0300-0400 vl	Costa Rica,Faro del Carib	5055do			
0300-0400	Costa Rica,RF Peace Intl	6980am	7385am		
0300-0400	Cuba, Radio Havana	6000na	9820na	9830na	
0300-0327	Czech Rep, Radio Prague	5930na	7345na		
0300-0400	Ecuador, HCJB	9745am	21455am		
0300-0330	Egypt, Radio Cairo	9475na			
0300-0350	Germany, Deutsche Welle	6045na	6185na	9535na	9640na
0300-0400	Germany,Overcomer Ministr	5880na	7335na		
0300-0400	Guatemala, Radio Cultural	3300do			
0300-0400 vl	Honduras, LV Evangelica	4820am			
0300-0400 as/vl	Italy, IRRS	7120va			
0300-0400	Japan, R Japan/NHK World	17685pa			
0300-0400 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0300-0400 vl	Lesotho, Radio Lesotho	4800do			
0300-0400 vl	Malaysia, RTM Kuching	7160do			
0300-0330 s	Malta, VO Mediterranean	15550au	17570as		
0300-0325	Netherlands, Radio	9860as	11660as		
0300-0400	New Zealand, R NZ Intl	17675pa			
0300-0400 vl	Papua New Guinea, NBC	9675do			
0300-0400	Russia,Voice of Russia WS	5930na	5940na	6150na	7105na
		7175na	7345na	7350na	9580na
0300-0400 mtwhfa	Russia,Voice of Russia WS	5920na			
0300-0330	S Africa, Channel Africa	5995af			
0300-0400	Singapore, SBC Radio One	6160do			
0300-0400 vl	Solomon Islands, SIBC	5020do			
0300-0400	Sri Lanka, Sri Lanka BC	9730as	15425as		
0300-0400	Taiwan, Taipei Radio Intl	5950na	7130as	9680na	11825as
		15345aw			
0300-0330	Thailand, Radio	9655am	11905am	15460na	
0300-0315 mtwhf	Uganda, Radio	4976do			
0300-0330	UK, BBC African Service	3255af	6005af	6135af	6190af
		9600af			
0300-0330	UK, BBC Asian Service	9605as	15310as	15360as	17790as
		21660as			
0300-0330	UK, BBC World Service	5970sa	5975am	6175na	6195eu
		7325sa	9410eu	9895am	11760me
		11850as	11955as	12095af	15280as
		15340as			
0300-0400	USA, KAIJ Dallas TX	5810am			
0300-0400	USA, KTBN Salt Lk City UT	7510am			
0300-0400	USA, KVOH Los Angeles CA	9975am			
0300-0400	USA, KWHR Naalehu HI	7560pa	17510as	17555pa	
0300-0400	USA, Voice of America	6035af	6080af	6115af	7105af
		7290af	7340af	7415af	9575af
		9885af			
0300-0330 smtwh	USA, Voice of America	4960af			
0300-0400	USA, WEWN Birmingham AL	5825eu			
0300-0300	USA, WGTG McCaysville GA	5085am			
0300-0400	USA, WHRI Noblesville IN	7315am			
0300-0400 m	USA, WHRI Noblesville IN	5770am			
0300-0400 twhfa	USA, WHRI Noblesville IN	5745am			
0300-0400	USA, WINB Red Lion PA	11950am			
0300-0400	USA, WJCR Upton KY	7490na			
0300-0400	USA, WRNO New Orleans LA	7355am			
0300-0359	USA, WSHB Cypress Crk SC	5850na			
0300-0400	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0300-0400	USA, WYFR Okeechobee FL	6065na	9505na		
0300-0310	Vatican State, Vatican R	6095am	7305ca		
0300-0400 vl	Zambia, R Zambia/ZNBC 1	4910do			
0300-0400 vl	Zambia, R Zambia/ZNBC 2	6165do			
0300-0400 vl	Zimbabwe, Zimbabwe BC	3396do			
0310-0340	Vatican State, Vatican R	7360af	9660af		
0329-0359 sm	Canada, R Canada Intl	6155na	9755na	9780na	
0330-0400	Albania, R Tirana Intl	6140na	7160na		
0330-0357	Czech Rep, Radio Prague	7350na	11600as		
0330-0400	Hungary, Radio Budapest	6010na	9840na		
0330-0355	Moldova, R Moldova Intl	7500na			
0330-0400	Sweden, Radio	7115na			
0330-0400	Tanzania, Radio	5050af			
0330-0400	UAE, Radio Dubai	12005na	13675na	15400na	21485na
0330-0400	UK, BBC African Service	3255af	6005af	6190af	9600af
		9610af	11730af		
0330-0400	UK, BBC Asian Service	9605as	11955as	15280as	15310as
		17790as	21660as		
0330-0400	UK, BBC World Service	5975am	6175na	6195eu	9410eu
		9895am	11760me	12095af	
0330-0357	Vietnam, Voice of	5905na			
0340-0350	Greece, Voice of	5895na	6260na	7450na	9425na
0345-0400	Burundi, Radio Nationale	6140do			
0345-0400	Tajikistan,Radio Dushanbe	4975as	9905as	11620as	
0345-0400 as	Uganda, Radio	4976do			
0356-0400	Zambia, Christian Voice	3330af	6065af		

Selected Programs

Sundays

0300 China, China Radio Intl: News. A ten-minute summary of world news.
0300 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0311 China, China Radio Intl: News about China. Ten minutes of home news.
0311 Russia, Voice of: Moscow Mailbag. Joe Adamov answers 15-20 listener questions every week.
0320 China, China Radio Intl: Chinese Folktales. The traditions, moral values, etiquette and customs of this ancient country and stories about real and legendary figures of China.
0325 China, China Radio Intl: The Cooking Show. Chinese recipes and cooking tips direct from Beijing.
0328 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0330 China, China Radio Intl: China Scrapbook. Snippets of facts about China's past and present.
0330 Russia, Voice of: News in Brief. Ninety seconds news summary every hour on the half-hour.
0332 Russia, Voice of: Your Top Tune. Win a prize by guessing which song of the three is the most popular.
0335 China, China Radio Intl: Music from China. Chinese music from traditional to pop to annual music festivals.
0347 Russia, Voice of: You Write to Moscow. A program based on listeners' letters, what they think about the programs, their opinions on events, and info on contests, DXing, stamp collecting, cooking, etc.

Mondays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): Sunday Service from the Mother Church. See S 2300.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0313 China, China Radio Intl: Sports Beat. See S 1213.
0320 China, China Radio Intl: China Snapshots. See S 1220.
0325 China, China Radio Intl: Report on Developing Countries. See S 1225.
0332 Russia, Voice of: Timelines. Estelle Winters hosts a variety program with an upbeat flair and an insight into Moscow life.
0335 China, China Radio Intl: Song of the Week. See S 1235.
0345 China, China Radio Intl: Voices from Other Lands. See S 1245.

Tuesdays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0320 China, China Radio Intl: Current Affairs. See M 1220.
0325 China, China Radio Intl: Press Clippings. See M 1225.
0330 China, China Radio Intl: China's Open Windows. See M 1230.
0330 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0332 Russia, Voice of: Kaleidoscope. See S 1532.
0334 China, China Radio Intl: Changzhou Reports. See M 1234.
0345 China, China Radio Intl: Idioms and Their Stories. See M 1245.

Wednesdays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0320 China, China Radio Intl: Current Affairs. See M 1220.
0328 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0332 Russia, Voice of: Your Top Tune. See S 0332.
0334 China, China Radio Intl: Press Clippings. See M 1225.
0339 China, China Radio Intl: Orient Arena. See T 1239.
0345 China, China Radio Intl: Voices from Other Lands. See S 1245.
0347 Russia, Voice of: You Write to Moscow. See S 0347.

Thursdays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0320 China, China Radio Intl: Current Affairs. See M 1220.
0330 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0332 Russia, Voice of: Audio Book Club. See M 0432.
0334 China, China Radio Intl: Press Clippings. See M 1225.
0338 China, China Radio Intl: Profile. See W 1238.
0345 China, China Radio Intl: Learn to Speak Chinese. See W 1245.

Fridays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0311 China, China Radio Intl: News about China. See S 0311.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0315 China, China Radio Intl: News Analysis. See H 1215.
0320 China, China Radio Intl: Current Affairs. See M 1220.
0328 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0332 Russia, Voice of: Russian by Radio. See W 1432.
0334 China, China Radio Intl: Press Clippings. See M 1225.
0338 China, China Radio Intl: Focus. See H 1238.
0344 China, China Radio Intl: Cultural Spectrum. See H 1244.

Saturdays

0300 China, China Radio Intl: News. See S 0300.
0300 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0311 Russia, Voice of: Moscow Mailbag. See S 0311.
0320 China, China Radio Intl: Current Affairs. See M 1220.
0330 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0332 Russia, Voice of: Audio Book Club. See M 0432.
0333 China, China Radio Intl: Press Clippings. See M 1225.
0337 China, China Radio Intl: Life in China. See F 1237.
0344 China, China Radio Intl: Global Review. See F 1244.

Frequencies

0400-0500	Anguilla,Caribbean Beacon	6090am			
0400-0430 as	Armenia, Voice of	4810eu			
0400-0500	Australia, Radio	9660pa	12080pa	13605as	15240pa
		15510pa	17795pa		
0400-0500 s	Australia, Radio	17750as			
0400-0500 vl	Australia, VL8K Katherine	5025do			
0400-0500 vl	Australia, VL8T Tent Crk	4910do			
0400-0500	Australia,DefenseForces R	13525as	15707as		
0400-0500	Canada, CBC N Quebec Svc	9625do			
0400-0500	Canada, CFRX Toronto	6070do			
0400-0500	Canada, CFVP Calgary	6030do			
0400-0500	Canada, CHNX Halifax	6130do			
0400-0500	Canada, CKZN St John's	6160do			
0400-0500	Canada, CKZU Vancouver	6160do			
0400-0429	Canada, R Canada Intl	6150me	9505me	9645me	
0400-0500	China, China Radio Intl	9560na	9730am		
0400-0500	Costa Rica,RF Peace Intl	6980am	7385am		
0400-0500	Cuba, Radio Havana	6000na	9820na	9830na	
0400-0500	Ecuador, HCJB	9745am	21455am		
0400-0450	Germany, Deutsche Welle	6015af	6065af	7225af	7280af
		9565af			
0400-0500 twhfa	Guatemala, Radio Cultural	3300do			
0400-0500 vl	Honduras, LV Evangelica	4890am			
0400-0430	Iraq, Radio Iraq Intl	11785eu			
0400-0500 as/vl	Italy, IRRS	7120va			
0400-0500 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0400-0430 mtwhfa	Mexico, Radio Mexico Intl	9705na			
0400-0500	New Zealand, R NZ Intl	17675pa			
0400-0430 m	Norway, Radio Norway Intl	7520na			
0400-0500 vl	Papua New Guinea, NBC	9675do			
0400-0456	Romania, R Romania Intl	5990na	6155na	9690na	11740na
		15335as			
0400-0500	Russia,Voice of Russia WS	5930na	6065na	6150na	7105na
		7175na	7260na	7345na	9580na
0400-0500 mtwhfa	Russia,Voice of Russia WS	5920na			
0400-0430	S Africa, Channel Africa	5955af			
0400-0500	Singapore, SBC Radio One	6160do			
0400-0430	Slovakia, AWR Europe	9465af			
0400-0500 vl	Solomon Islands, SIBC	5020do			
0400-0430	Sri Lanka, Sri Lanka BC	9730as	15425as		
0400-0500	Switzerland, Swiss R Intl	6135na	9885na	9905na	
0400-0415	Tajikistan,Radio Dushanbe	7245as			
0400-0430	Tanzania, Radio	5050af			
0400-0430	Thailand, Radio	9655am	11905am	15460na	
0400-0500	Turkey, Voice of	7300eu	9685as	17705au	
0400-0415	Uganda, Radio	4976do			
0400-0430	UK, BBC African Service	3255af	6005af	6190af	7160af
		9610af	11730af		
0400-0430	UK, BBC World Service	3955eu	5975am	6175na	6180eu
		6195eu	9410eu	9895am	11760me
		12095af	15575as		
0400-0500	Ukraine, R Ukraine Intl	6020eu	7150na	7205eu	11905eu
0400-0500	USA, KAIJ Dallas TX	5810am			
0400-0500	USA, KTBN Salt Lk City UT	7510am			
0400-0500	USA, KVOH Los Angeles CA	9975am			
0400-0500	USA, KWHR Naalehu HI	7560pa	17510as	17555pa	
0400-0500	USA, Voice of America	6035af	6080af	7170af	7280af
		7290af	7415af	9575af	9775af
		9885af			
0400-0500	USA, WEWN Birmingham AL	5825eu			
0400-0500	USA, WGTG McCaysville GA	5085am			
0400-0500	USA, WHRI Noblesville IN	5770am	7315am		
0400-0500	USA, WINB Red Lion PA	11950am			
0400-0500	USA, WJCR Upton KY	7490na			
0400-0500	USA, WMLK Bethel PA	9465am			
0400-0500 twhfa	USA, WRMI/R Miami Intl	9955am			
0400-0500	USA, WRNO New Orleans LA	7395am			
0400-0459 mw	USA, WSHB Cypress Crk SC	9835af			
0400-0500	USA, WWCR Nashville TN	2390am	3215am	5070am	5935am
0400-0500	USA, WYFR Okeechobee FL	6065na	9505na	9985eu	
0400-0430	Vietnam, Voice of	5940na	7270na	7400na	9840na
		12020na	15010na		
0400-0500	Zambia, Christian Voice	3330af	6065af		
0400-0500 vl	Zambia, R Zambia/ZNBC 1	4910do			
0400-0500 vl	Zambia, R Zambia/ZNBC 2	6165do			
0400-0500 vl	Zimbabwe, Zimbabwe BC	3396do			
0415-0500 vl	Malawi, MBC	5993do			
0415-0500 s	USA, WRMI/R Miami Intl	9955am			
0425-0440 vl	Italy, RAI Intl	6010eu	7270na		
0425-0500	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0430-0500 m-f/vl	Lesotho, Radio Lesotho	4800do			
0430-0455	Moldova, R Moldova Intl	7500na			
0430-0500	Netherlands, Radio	6165na	9590na		
0430-0500 mtwhf	Portugal, R Portugal Intl	6150am	9570am		
0430-0500	Swaziland, Trans World R	3200af	4775af	6100af	
0430-0500	UK, BBC African Service	3255af	6005af	6190af	7160af
		9600af	15420af		
0430-0500	UK, BBC Asian Service	11955as	15280as	15310as	17790as
		21660as			
0430-0500	UK, BBC World Service	5875eu	5975am	6175am	11760me
		12095af	15575as		
0430-0500 s	UK, BBC World Service	3955eu	6180eu	6195eu	9410eu
0455-0500	Malaysia, Voice of	6175as	9750as	15295au	
0455-0500	Nigeria, Voice of	7255af			

Selected Programs

Sundays

0411 Russia, Voice of: News and Views. Russian views on news developments.
0420 China, China Radio Intl: Chinese Folktales. See S 0320.
0425 China, China Radio Intl: The Cooking Show. See S 0325.
0430 China, China Radio Intl: China Scrapbook. See S 0330.
0430 Netherlands, Radio: News. See S 0030.
0432 Russia, Voice of: A Christian Message from Moscow. The history of the Russian Orthodox Church and related topics are described together with ecclesiastical background music.
0435 China, China Radio Intl: Music from China. See S 0335.
0438 Netherlands, Radio: Newsline. See S 0038.
0454 Netherlands, Radio: Weekend. See S 0053.

Mondays

0400 Herald Broadcasting (WSHB #2): Sunday Service from the Mother Church. See S 2300.
0411 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0413 China, China Radio Intl: Sports Beat. See S 1213.
0420 China, China Radio Intl: China Snapshots. See S 1220.
0425 China, China Radio Intl: Report on Developing Countries. See S 1225.
0430 Netherlands, Radio: News. See S 0030.
0432 Russia, Voice of: Audio Book Club. The best of Russian classic and contemporary literature.
0435 China, China Radio Intl: Song of the Week. See S 1235.
0436 Netherlands, Radio: Sincerely Yours. See S 1138.
0445 China, China Radio Intl: Voices from Other Lands. See S 1245.
0455 Netherlands, Radio: Sounds Interesting. See S 1153.

Tuesdays

0411 Russia, Voice of: News and Views. See S 0411.
0420 China, China Radio Intl: Current Affairs. See M 1220.
0425 China, China Radio Intl: Press Clippings. See M 1225.
0430 China, China Radio Intl: China's Open Windows. See M 1230.
0430 Netherlands, Radio: News. See S 0030.
0432 Russia, Voice of: Alternative Programs. An interview or any of the music or feature programs of Voice of Russia.
0434 China, China Radio Intl: Changzhou Reports. See M 1234.
0438 Netherlands, Radio: Newsline. See S 0038.
0445 China, China Radio Intl: Idioms and Their Stories. See M 1245.
0453 Netherlands, Radio: Research File. See M 1153.

Wednesdays

0400 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
0411 Russia, Voice of: News and Views. See S 0411.
0420 China, China Radio Intl: Current Affairs. See M 1220.
0428 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
0430 Netherlands, Radio: News. See S 0030.
0434 China, China Radio Intl: Press Clippings. See M 1225.
0438 Netherlands, Radio: Newsline. See S 0038.
0439 China, China Radio Intl: Orient Arena. See T 1239.
0445 China, China Radio Intl: Voices from Other Lands. See S 1245.
0453 Netherlands, Radio: Mirror Images. Weekly magazine of music, the arts, culture, and European festivals, produced and presented by David Swatling.

Thursdays

0411 Russia, Voice of: News and Views. See S 0411.
0420 China, China Radio Intl: Current Affairs. See M 1220.
0430 Netherlands, Radio: News. See S 0030.
0434 China, China Radio Intl: Press Clippings. See M 1225.
0438 China, China Radio Intl: Profile. See W 1238.
0438 Netherlands, Radio: Newsline. See S 0038.
0445 China, China Radio Intl: Learn to Speak Chinese. See W 1245.
0454 Radio Netherlands: Documentary. Belgium (26th). See F 2354.
0454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (19th). See H 1454.
0454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (5th). See W 1154.
0454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (12th). See A 0154.

Fridays

0411 China, China Radio Intl: News about China. See S 0311.
0411 Russia, Voice of: News and Views. See S 0411.
0420 China, China Radio Intl: Current Affairs. See M 1220.
0430 Netherlands, Radio: News. See S 0030.
0434 China, China Radio Intl: Press Clippings. See M 1225.
0438 China, China Radio Intl: Focus. See H 1238.
0438 Netherlands, Radio: Newsline. See S 0038.
0444 China, China Radio Intl: Cultural Spectrum. See H 1244.
0453 Netherlands, Radio: Media Network. See H 1153.

Saturdays

0411 Russia, Voice of: News and Views. See S 0411.
0420 China, China Radio Intl: Current Affairs. See M 1220.
0430 Netherlands, Radio: News. See S 0030.
0433 China, China Radio Intl: Press Clippings. See M 1225.
0437 China, China Radio Intl: Life in China. See F 1237.
0438 Netherlands, Radio: Newsline. See S 0038.
0444 China, China Radio Intl: Global Review. See F 1244.
0453 Netherlands, Radio: A Good Life. See M 1253.

Frequencies

0500-0600	Anguilla,Caribbean Beacon	6090am			
0500-0600	Australia, Radio	9660pa	12080pa	13605as	15240pa
		15510as	17795pa		
0500-0600 a	Australia, Radio	17750as			
0500-0600 vl	Australia, VL8K Katherine	5025do			
0500-0600 vl	Australia, VL8T Tent Crk	4910do			
0500-0600	Australia,DefenseForces R	13525as	15707as		
0500-0600	Bulgaria, Radio	7375na	9485na		
0500-0600 vl	Cameroon, Radio Cameroon	4850do			
0500-0600	Canada, CBC N Quebec Svc	9625do			
0500-0600	Canada, CFRX Toronto	6070do			
0500-0600	Canada, CFVP Calgary	6030do			
0500-0600	Canada, CHNX Halifax	6130do			
0500-0600	Canada, CKZU Vancouver	6160do			
0500-0600	China, China Radio Intl	9560na			
0500-0600	Costa Rica, Adv World R	5030ca	6150ca	9725ca	
0500-0600 as	Costa Rica, Adv World R	7375am			
0500-0600	Costa Rica,RF Peace Intl	6980am	7385am		
0500-0600	Cuba, Radio Havana	6180na	9820na	9830na	
0500-0600 vl	Cyprus, BRT International	6150do			
0500-0600	Ecuador, HCJB	9745am	21455am		
0500-0550	Germany, Deutsche Welle	5960na	6100na	6120na	6185na
0500-0600	Guyana, GBC/Voice of	5950do			
0500-0515	Israel, Kol Israel	7465na	9435na	17545na	
0500-0600 as/vl	Italy, IRRS	7120va			
0500-0600	Japan, R Japan/NHK World	6110na	6150eu	11840as	11920as
0500-0530	Japan, R Japan/NHK World	9835as	11895am	15230am	
0500-0600 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0500-0600 vl	Kiribati, Radio	9810do			
0500-0505	Lesotho, Radio Lesotho	4800do			
0500-0600	Liberia,LCN/R Liberia Int	5100do			
0500-0510 mtwhf	Malawi, MBC	3380do			
0500-0530 mtwhf	Mexico, Radio Mexico Intl	9705na			
0500-0525	Netherlands, Radio	6165na	9590na		
0500-0600	New Zealand, R NZ Intl	11905pa			
0500-0505	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0500-0600	Nigeria, Voice of	7255af			
0500-0600	North Korea, R Pyongyang	3560as	11740as	13790as	
0500-0600 vl	Papua New Guinea, NBC	9675do			
0500-0600	Russia,Voice of Russia WS	5905na	5930na	6005na	6065na
		6150na	7105na	7175na	7330na
		7345na	9580na		
0500-0600 mtwhfa	Russia,Voice of Russia WS	5920na			
0500-0530	S Africa, Channel Africa	9675af			
0500-0600	Singapore, SBC Radio One	6160do			
0500-0600 vl	Solomon Islands, SIBC	5020do			
0500-0600	Spain, R Exterior Espana	6055am			
0500-0600	Swaziland, Trans World R	4775af	6100af		
0500-0530	Switzerland, Swiss R Intl	5840eu	6165eu		
0500-0515	Uganda, Radio	4976do			
0500-0600	UK, BBC African Service	3255af	6005af	6190af	7160af
		9600af	15420af	17885af	
0500-0530	UK, BBC Asian Service	9740as	11955as	15280as	15310as
		15360as	17760as	17790as	21660as
0500-0530	UK, BBC World Service	3955eu	5975am	6175am	6180eu
		6195eu	9410eu	11760me	12095eu
		15575as	17640af		
0500-0600	USA, KAIJ Dallas TX	5810am			
0500-0600	USA, KTBN Salt Lk City UT	7510am			
0500-0600	USA, KVOH Los Angeles CA	9975am			
0500-0600	USA, KWHR Naalehu HI	7560as	9930as	17555pa	
0500-0600	USA, Voice of America	5970af	6035af	6080af	7170eu
		7295af	9700af	9775af	11825me
		11965eu	12080af	15205eu	
0500-0600	USA, WGTG McCaysville GA	5085am			
0500-0600	USA, WHRI Noblesville IN	5770am	7315am		
0500-0600	USA, WINB Red Lion PA	11950am			
0500-0600	USA, WJCR Upton KY	7490na			
0500-0530	USA, WRMI/R Miami Intl	9955am			
0500-0600	USA, WRNO New Orleans LA	7395am			
0500-0559 w	USA, WSHB Cypress Crk SC	7535eu			
0500-0559 mw	USA, WSHB Cypress Crk SC	7425af			
0500-0600	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0500-0600	USA, WYFR Okeechobee FL	5985na	9985af	11550eu	
0500-0520	Vatican State, Vatican R	7360af	9660af	11625af	
0500-0600	Zambia, Christian Voice	3330af	6065af		
0500-0530 vl	Zambia, R Zambia/ZNBC 1	4910do			
0500-0600 vl	Zambia, R Zambia/ZNBC 2	6165do			
0500-0530 vl	Zimbabwe, Zimbabwe BC	3396do			
0505-0600	Swaziland, Trans World R	9500af			
0525-0600	Ghana, Ghana Broadc Corp	3366do	4915do		
0530-0600	Austria, R Austria Intl	6015na	6155eu	13730eu	15410me
		17870me			
0530-0600	Thailand, Radio	9655eu	11905eu	15115eu	
0530-0548	UAE, Radio Dubai	15435as	17830as	21700as	
0530-0600	UK, BBC Asian Service	9740as	11955pa	15310as	15360as
		17760as	21660as		
0530-0600	UK, BBC World Service	3990eu	5975am	6050eu	6175am
		7150eu	7270eu	11760me	15575as
		17640af			
0530-0600 as	UK, BBC World Service	3955eu	6180eu	6195eu	9410eu
		12095eu			
0530-0600 vl	Zambia, R Zambia/ZNBC 1	7220do			
0530-0600 vl	Zimbabwe, Zimbabwe BC	5975do			
0545-0600	UK, BBC African Service	7275af	9710af		

Selected Programs

Sundays

0500 China, China Radio Intl: News. See S 0300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Program Preview. A review of programs to be featured in the coming week.
0520 China, China Radio Intl: Chinese Folktales. See S 0320.
0525 China, China Radio Intl: The Cooking Show. See S 0325.
0530 China, China Radio Intl: China Scrapbook. See S 0330.
0532 Russia, Voice of: Moscow Yesterday and Today. Sit back and enjoy a great program about Russian history with magnificent sound effects.
0535 China, China Radio Intl: Music from China. See S 0335.

Mondays

0500 China, China Radio Intl: News. See S 0300.
0500 Herald Broadcasting (WSHB #2): Sunday Service from the Mother Church. See S 2300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Program Preview. See S 0511.
0513 China, China Radio Intl: Sports Beat. See S 1213.
0520 China, China Radio Intl: China Snapshots. See S 1220.
0525 China, China Radio Intl: Report on Developing Countries. See S 1225.
0532 Russia, Voice of: The Jazz Show. The world of Russian jazz.
0535 China, China Radio Intl: Song of the Week. See S 1235.
0545 China, China Radio Intl: Voices from Other Lands. See S 1245.

Tuesdays

0500 China, China Radio Intl: News. See S 0300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0520 China, China Radio Intl: Current Affairs. See M 1220.
0525 China, China Radio Intl: Press Clippings. See M 1225.
0530 China, China Radio Intl: China's Open Windows. See M 1230.
0532 Russia, Voice of: Yours for the Asking. A 30-minute musical request program.
0534 China, China Radio Intl: Changzhou Reports. See M 1234.
0545 China, China Radio Intl: Idioms and Their Stories. See M 1245.

Wednesdays

0500 China, China Radio Intl: News. See S 0300.
0500 Herald Broadcasting (WSHB #1&2): Bible Lesson. See S 0000.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0520 China, China Radio Intl: Current Affairs. See M 1220.
0528 Herald Broadcasting (WSHB #1&2): The Christian Science Sentinel. See S 0028.
0532 Russia, Voice of: Music at Your Request. See T 1532.
0534 China, China Radio Intl: Press Clippings. See M 1225.
0539 China, China Radio Intl: Orient Arena. See T 1239.
0545 China, China Radio Intl: Voices from Other Lands. See S 1245.

Thursdays

0500 China, China Radio Intl: News. See S 0300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0520 China, China Radio Intl: Current Affairs. See M 1220.
0532 Russia, Voice of: Folk Box. See M 1532.
0534 China, China Radio Intl: Press Clippings. See M 1225.
0538 China, China Radio Intl: Profile. See W 1238.
0545 China, China Radio Intl: Learn to Speak Chinese. See W 1245.

Fridays

0500 China, China Radio Intl: News. See S 0300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0515 China, China Radio Intl: News Analysis. See H 1215.
0520 China, China Radio Intl: Current Affairs. See M 1220.
0532 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
0534 China, China Radio Intl: Press Clippings. See M 1225.
0538 China, China Radio Intl: Focus. See H 1238.
0544 China, China Radio Intl: Cultural Spectrum. See H 1244.

Saturdays

0500 China, China Radio Intl: News. See S 0300.
0511 China, China Radio Intl: News about China. See S 0311.
0511 Russia, Voice of: Science and Engineering in the Commonwealth. See S 0611.
0520 China, China Radio Intl: Current Affairs. See M 1220.
0532 Russia, Voice of: Timelines. See M 0332.
0533 China, China Radio Intl: Press Clippings. See M 1225.
0537 China, China Radio Intl: Life in China. See F 1237.
0544 China, China Radio Intl: Global Review. See F 1244.

Frequencies

0600-0700	Anguilla,Caribbean Beacon	6090am			
0600-0700	Australia, Radio	9660pa	11880pa	12080pa	13605as
		15240pa	15415as	15510as	17750as
0600-0700 vl	Australia, VL8K Katherine	5025do			
0600-0700 vl	Australia, VL8T Tent Crk	4910do			
0600-0630	Australia,DefenseForces R	13525as	15707as		
0600-0700 vl	Canada, CBC N Quebec Svc	9625do			
0600-0700	Canada, CFRX Toronto	6070do			
0600-0700	Canada, CFVP Calgary	6030do			
0600-0700	Canada, CHNX Halifax	6130do			
0600-0700	Canada, CKZU Vancouver	6160do			
0600-0659 mtwhf	Canada, R Canada Intl	6050va	6150va	9740af	9760va
		11905af			
0600-0700	Costa Rica,RF Peace Intl	6980am	7385am		
0600-0700	Cuba, Radio Havana	6180na	9820na	9830na	
0600-0700	Ecuador, HCJB	9745am	21455am		
0600-0650	Germany, Deutsche Welle	6045af	7225af	9565af	11765af
		17820as	21705me		
0600-0700	Germany,Overcomer Ministr	9500au			
0600-0615	Ghana, Ghana Broadc Corp	3366do	4915do		
0600-0700	Guyana, GBC/Voice of	5950do			
0600-0700 vl	Italy, IRRS	3985va			
0600-0700	Japan, R Japan/NHK World	5975eu	6190na	7230eu	9505pa
		9835na	11740as	11840as	11920pa
		15550as	15570as	17810as	
0600-0700 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0600-0700 vl	Kiribati, Radio	9810do			
0600-0700	Liberia, Radio Veritas	3425do			
0600-0700	Liberia,LCN/R Liberia Int	5100do			
0600-0700	Malaysia, Voice of	6175as	9750as	15295au	
0600-0700	New Zealand, R NZ Intl	11905pa			
0600-0630	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0600-0700	Nigeria, Voice of	7255af			
0600-0700 vl	Papua New Guinea, NBC	9675do			
0600-0700	Romania, R Romania Intl	5965eu	6095eu		
0600-0700	Russia,Voice of Russia WS	5905na	5920na	5930na	6005na
		6065na	6150na	7175na	7330na
		9580na	12025as	12055na	15460na
		15470au	17495as	17570au	17795as
		21790au			
0600-0630	S Africa, Channel Africa	11900af			
0600-0630	S Africa, Trans World R	11730af			
0600-0610	Sierra Leone, SLBS	3316do			
0600-0700	Singapore, SBC Radio One	6160do			
0600-0630	Slovakia, AWR Europe	11640af			
0600-0700 vl	Solomon Islands, SIBC	5020do			
0600-0700	Swaziland, Trans World R	4775af	6100af	9500af	
0600-0700	UK, BBC African Service	6005af	6155af	6190af	7160af
		9600af	11940af	15420af	17885af
0600-0700	UK, BBC Asian Service	7145pa	9740as	11955pa	15310as
		15360as	17760as	17790as	21660as
0600-0630	UK, BBC World Service	3955eu	5975am	6175am	6180eu
		6195eu	7325eu	9410eu	11760me
		12095eu	15565eu	15575as	17640af
0600-0700	USA, KAIJ Dallas TX	5810am			
0600-0700	USA, KTBN Salt Lk City UT	7510am			
0600-0700	USA, KVOH Los Angeles CA	9975am			
0600-0700	USA, KWHR Naalehu HI	7560as	9930as	17555pa	
0600-0630	USA, Voice of America	5970af	5995me	6035af	6080af
		7170eu	7285af	11805eu	11825me
		11950af	12080af	15205eu	15600af
0600-0700	USA, WGTG McCaysville GA	5085am			
0600-0700	USA, WHRI Noblesville IN	5770am	7315am		
0600-0700	USA, WINB Red Lion PA	11950am			
0600-0700	USA, WJCR Upton KY	7490na			
0600-0700	USA, WRNO New Orleans LA	7395am			
0600-0659 tf	USA, WSHB Cypress Crk SC	7535eu			
0600-0700	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0600-0700	USA, WYFR Okeechobee FL	5985am	7355eu	9985eu	
0600-0700 vl	Vanuatu, Radio	3945do	4960do		
0600-0620	Vatican State, Vatican R	4005eu	5883eu	7250eu	
0600-0700	Yemen, Radio Aden	9780do			
0600-0700	Zambia, Christian Voice	3330af	6065af		
0600-0700 vl	Zambia, R Zambia/ZNBC 1	7220do			
0600-0700 vl	Zimbabwe, Zimbabwe BC	5975do			
0605-0700	Swaziland, Trans World R	9650af			
0630-0700	Austria, R Austria Intl	6015na			
0630-0700	Georgia, Georgian Radio	11805eu			
0630-0700	Switzerland, Swiss R Intl	5840eu	6165eu		
0630-0700	UK, BBC World Service	5975am	6175am	6180eu	7325eu
		9410eu	11760me	12095eu	15565eu
		15575as	17640af		
0630-0700 as	UK, BBC World Service	3955eu	6195eu		
0630-0645 s	UK, BBC World Service	6010eu	9740eu		
0630-0700	USA, Voice of America	5995me	7170eu	11805eu	11825me
		15205eu			
0630-0700 as	USA, Voice of America	5970af	6035af	6080af	7285af
		11950af	12080af	15600af	
0630-0700	Vatican State, Vatican R	9660af	11625af	13765af	
0640-0656	Romania, R Romania Intl	7105eu	9510eu	9625eu	11775eu
0645-0700	UK, BBC World Service	5875eu	7260eu		

Selected Programs

Sundays

0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: With Heart and Mind. How this week's liturgical readings apply to our everyday lives.
0608 Vatican State, Vatican Radio: On-the-Air. A preview of upcoming programs and broadcast changes and a look behind-the-scenes at Vatican Radio.
0611 Russia, Voice of: Science and Engineering in the Commonwealth. The latest developments in science and technology.
0630 Russia, Voice of: News in Brief. See S 0330.
0632 Russia, Voice of: This is Russia. A program which helps you to get to know Russia, the Russians, and it's ethnic minorities better.

Mondays

0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: To the Ends of the Earth. A 25-episode series of Bible-based radio dramas.
0611 Russia, Voice of: Moscow Mailbag. See S 0311.
0630 Russia, Voice of: News in Brief. See S 0330.
0632 Russia, Voice of: This is Russia. See S 0632.

Tuesdays

0600 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: A Room with a View of the Vatican. A look at the activities of the Catholic Church in Rome.
0611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
0615 Vatican State, Vatican Radio: Ask the Abbot. See M 2300.
0628 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0630 Russia, Voice of: News in Brief. See S 0330.
0632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
0652 Vatican State, Vatican Radio: Panorama. A daily summary of news from the news agencies.
0656 Vatican State, Vatican Radio: News for Young People. Current events for the Catholic youth of Africa.

Wednesdays

0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: The Rome Report. A behind the scenes review of issues currently confronting the church and the world.
0611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
0616 Vatican State, Vatican Radio: What Can I Do?. See T 2300.
0630 Russia, Voice of: News in Brief. See S 0330.
0632 Russia, Voice of: This is Russia. See S 0632.

Thursdays

0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: The Pope and the People. Recent public statements by the Pope and responses from the man on the street.
0605 Vatican State, Vatican Radio: Pilgrim City. A look at whose been to Rome recently.
0611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
0614 Vatican State, Vatican Radio: Postcards from Rome. An audio vignette of life in the eternal city.
0630 Russia, Voice of: News in Brief. See S 0330.
0630 Vatican State, Vatican Radio: News. See S 0152.
0632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
0644 Vatican State, Vatican Radio: Health and Healing. A report on medical findings relating to the African Continent with emphasis on AIDS.
0652 Vatican State, Vatican Radio: Panorama. See T 0652.

Fridays

0600 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: Then and Now. Whatever happened to yesterday's headlines?
0611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
0628 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
0630 Russia, Voice of: News in Brief. See S 0330.
0632 Russia, Voice of: This is Russia. See S 0632.
0645 UK, BBC London (AE am only): Images of Britain (6th,13th,20th). See M 0145.
0652 Vatican State, Vatican Radio: Panorama. See T 0652.

Saturdays

0600 Russia, Voice of: News. See S 0200.
0600 Vatican State, Vatican Radio: By the Way.... Putting a Catholic perspective on issues in the news.
0606 Vatican State, Vatican Radio: Roundtable Discussion. Conversation about today's religious questions.
0611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
0630 Russia, Voice of: News in Brief. See S 0330.
0630 Vatican State, Vatican Radio: The Gospel. Readings from the holy book.
0632 Russia, Voice of: A Christian Message from Moscow. See S 0432.
0635 Vatican State, Vatican Radio: Reflection. A closing prayer by a prominent African.
0650 Vatican State, Vatican Radio: News of the Church. See H 0140.
0654 Vatican State, Vatican Radio: Panorama. See T 0652.

FREQUENCIES

0700-0800	Anguilla,Caribbean Beacon	6090am			
0700-0800	Australia, Radio	9660pa	11880pa	12080pa	13605pa
		15240pa	15415as	15510as	17750as
0700-0800 vl	Australia, VL8K Katherine	5025do			
0700-0800 vl	Australia, VL8T Tent Crk	4910do			
0700-0800	Canada, CFRX Toronto	6070do			
0700-0800	Canada, CFVP Calgary	6030do			
0700-0800	Canada, CHNX Halifax	6130do			
0700-0800	Canada, CKZU Vancouver	6160do			
0700-0800	Costa Rica,RF Peace Intl	6980am	7385am		
0700-0800	Ecuador, HCJB	5865eu	9365eu	9640pa	21455au
0700-0800 as	Eqt Guinea, R East Africa	15186af			
0700-0800 mtwhf	Eqt Guinea, Radio Africa	15186af			
0700-0800	Germany,Overcomer Ministr	9500au			
0700-0715	Ghana, Ghana Broadc Corp	3366do	4915do		
0700-0800	Guyana, GBC/Voice of	5950do			
0700-0800 vl	Italy, IRRS	3985va			
0700-0800	Japan, R Japan/NHK World	7230eu	11740as	11840as	11850as
	11920as 15230af	15570as	17810as	17815af	
0700-0800 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
0700-0800 vl	Kiribati, Radio	9810do			
0700-0800	Liberia, Radio Veritas	3425do			
0700-0715	Liberia,LCN/R Liberia Int	5100do			
0700-0800 asmtwh	Malaysia, Radio	7295do			
0700-0800	Malaysia, Voice of	6175as	9750as	15295au	
0700-0800	New Zealand, R NZ Intl	11905pa			
0700-0730 s	Norway, Radio Norway Intl	9590va	11625va		
0700-0800 vl	Papua New Guinea, NBC	9675do			
0700-0756	Romania, R Romania Intl	11775af	15365af	17775af	
0700-0800	Russia,Voice of Russia WS	5905na	5920na	5930na	6005na
	6065na 6150na	7175na	7330na	9580na	12025as
	12055as 15460as	15470as	17495as	17570as	17795as
	17860as 21790as				
0700-0710	Sierra Leone, SLBS	3316do			
0700-0800	Singapore, SBC Radio One	6160do			
0700-0730	Slovakia, AWR Europe	9435eu			
0700-0800 vl	Solomon Islands, SIBC	5020do			
0700-0735	Swaziland, Trans World R	6100af	9500af	9650af	
0700-0800	Taiwan, Taipei Radio Intl	5950na			
0700-0715	UK, BBC African Service	6005af	6190af	9600af	11940af
		17830af			
0700-0800 as	UK, BBC African Service	17885af			
0700-0800	UK, BBC Asian Service	7145pa	9740as	11955pa	15310as
		15360as	17760as	17790as	21660as
0700-0730	UK, BBC World Service	5975am	6175am	6180eu	6195eu
		7325eu	9410eu	11760me	12095eu
		15485eu	15565eu	15575as	17640eu
0700-0800	USA, KAIJ Dallas TX	5810am			
0700-0800	USA, KTBN Salt Lk City UT	7510am			
0700-0800	USA, KVOH Los Angeles CA	9975am			
0700-0800	USA, KWHR Naalehu HI	7560as	9930as	11565pa	
0700-0800	USA, WEWN Birmingham AL	5825eu			
0700-0800	USA, WHRI Noblesville IN	5770am	7315am		
0700-0800	USA, WJCR Upton KY	7490na			
0700-0800	USA, WRNO New Orleans LA	7395am			
0700-0800	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0700-0800	USA, WYFR Okeechobee FL	7355eu	9455af	9985af	
0700-0800 vl	Vanuatu, Radio	3945do	4960do		
0700-0800	Zambia, Christian Voice	6065af			
0700-0800 vl	Zambia, R Zambia/ZNBC 1	7220do			
0700-0800 vl	Zimbabwe, Zimbabwe BC	5975do			
0703-0710 mtwhf	Croatia, Croatian Radio	6175eu	7185eu	11730au	
0715-0730 s	Greece, Voice of	7430eu	7450eu	9425au	9775au
		11645eu			
0715-0730	UK, BBC African Service	6005af	6190af	9600af	11940af
		15400af	17830af		
0715-0730	UK, BBC World Service	9635eu	11680eu	11845eu	13745eu
		15325eu			
0730-0740 s	Greece, Voice of	7430eu	7450eu	9425au	9775au
		11645eu			
0730-0800	Netherlands, Radio	9830pa	11895pa		
0730-0800	Switzerland, Swiss R Intl	9885af	11860af	13635af	
0730-0800	UK, BBC African Service	6190af	9600af	11940af	15400af
		17830af			
0730-0800	UK, BBC World Service	5975am	6175am	7325eu	9410eu
		11760me	12095eu	15485eu	15565eu
		17640eu			
0730-0800 as	UK, BBC World Service	15575as			
0730-0745	UK, BBC World Service	5875eu	7260eu		
0730-0745 mtwhfa	Vatican State, Vatican R	4005eu	5883eu	6185eu	7250eu
		9645eu	11740eu	15595va	
0735-0800 as	Swaziland, Trans World R	6100af	9500af	9650af	
0740-0800	Guam, TWR/KTWR	15200as			
0745-0800	Albania, TWR Tirana	9685eu			
0745-0800 s	Ghana, Ghana Broadc Corp	3366do	4915do		
0745-0800 as	Monaco, Trans World Radio	9755eu			
0755-0800 mtwhf	Monaco, Trans World Radio	9755eu			

0800-0900	Albania, TWR Tirana	9685eu			
0800-0900	Anguilla,Caribbean Beacon	6090am			
0800-0830	Australia, Radio	5995pa	9580pa	9710pa	11880pa
		12080pa	15415as	15510as	17750as
0800-0830 vl	Australia, VL8K Katherine	5025do			
0800-0830 vl	Australia, VL8T Tent Crk	4910do			
0800-0900 mtwhfa	Bhutan, Bhutan BC Service	5030do			
0800-0900 vl	Canada, CBC N Quebec Svc	9625do			
0800-0900	Canada, CFRX Toronto	6070do			
0800-0900	Canada, CFVP Calgary	6030do			
0800-0900	Canada, CHNX Halifax	6130do			
0800-0900	Canada, CKZU Vancouver	6160do			
0800-0900	Costa Rica,RF Peace Intl	6980am	7385am		
0800-0857	Czech Rep, Radio Prague	9505eu	11600as		
0800-0900	Ecuador, HCJB	5865eu	9365eu	9640pa	21455au
0800-0900 as	Eqt Guinea, R East Africa	15186af			
0800-0900 mtwhf	Eqt Guinea, Radio Africa	15186af			
0800-0805 s	Ghana, Ghana Broadc Corp	3366do			
0800-0900	Guam, TWR/KTWR	15200as			
0800-0900	Guyana, GBC/Voice of	5950do			
0800-0900	Indonesia, Voice of	11785as			
0800-0830 vl	Italy, IRRS	3985va			
0800-0900 vl	Kiribati, Radio	9810do			
0800-0900	Liberia, Radio Veritas	3425do			
0800-0900	Liberia,LCN/R Liberia Int	5100do			
0800-0900	Malaysia, Radio	7295do			
0800-0825	Malaysia, Voice of	6175as	9750as	15295au	
0800-0900	Monaco, Trans World Radio	9755eu			
0800-0830	Netherlands, Radio	9830pa	11895pa		
0800-0815 mtwhf	New Zealand, R NZ Intl	11905pa			
0800-0815 s	New Zealand, R NZ Intl	9700pa			
0800-0830 s	Norway, Radio Norway Intl	11625au			
0800-0805	Pakistan, Radio	15530eu	15550eu	17555eu	17835eu
0800-0900 as	Palau, KHBN/Voice of Hope	9985as			
0800-0900 vl	Papua New Guinea, NBC	9675do			
0800-0900	Russia,Voice of Russia WS	9875as	12025as	12055as	15460as
		17495as	17795as	17860as	
0800-0900 f	Seychelles, FEBA Radio	15540as			
0800-0810	Sierra Leone, SLBS	3316do			
0800-0900	Singapore, SBC Radio One	6160do			
0800-0900 vl	Solomon Islands, SIBC	5020do			
0800-0900	South Korea, R Korea Intl	9570au	13670eu		
0800-0805 as	Swaziland, Trans World R	6100af	9500af	9650af	
0800-0900 as	UK, BBC African Service	17885af			
0800-0810	UK, BBC Asian Service	7145pa	11750as	11955pa	15310as
		15360as	17760as	17790as	21660as
0800-0900	UK, BBC World Service	7325eu	9410eu	11760me	12095eu
		15485eu	15565eu	17640eu	
0800-0900 as	UK, BBC World Service	15575as			
0800-0900	USA, KAIJ Dallas TX	5810am			
0800-0859	USA, KHBI N Mariana Is	15665eu			
0800-0900	USA, KNLS Anchor Point AK	6150as			
0800-0900	USA, KTBN Salt Lk City UT	7510am			
0800-0900	USA, KWHR Naalehu HI	7560as	11565pa		
0800-0900	USA, WEWN Birmingham AL	5825eu			
0800-0900	USA, WHRI Noblesville IN	5770am	7315am		
0800-0900	USA, WJCR Upton KY	7490na			
0800-0859 smtwh	USA, WSHB Cypress Crk SC	9845pa			
0800-0859 sa	USA, WSHB Cypress Crk SC	7535eu			
0800-0900	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0800-0900	Zambia, Christian Voice	6065af			
0800-0900 vl	Zambia, R Zambia/ZNBC 1	7220do			
0800-0900 vl	Zimbabwe, Zimbabwe BC	5975do			
0803-0810 as	Croatia, Croatian Radio	6175eu	7185eu	11730au	
0810-0900	UK, BBC Asian Service	9740as	11750as	11955pa	15310as
		15360as	17760as	21660as	
0815-0900	New Zealand, R NZ Intl	9700pa			
0815-0900 mtwtf	Nigeria, FRCN/Radio	3326do	4770do	4990do	
0830-0900	Australia, Radio	5995pa	6080as	9580pa	9710pa
		12080pa	15415as	15510pa	17750as
0830-0900 vl	Australia, VL8A Alice Spg	2310do			
0830-0900 vl	Australia, VL8K Katherine	2485do			
0830-0900 vl	Australia, VL8T Tent Crk	2325do			
0830-0900	Austria, R Austria Intl	6155eu	13730eu	17870me	
0830-0855	Belgium, R Vlaanderen Int	6130eu	13795au		
0830-0900	Georgia, Georgian Radio	11910eu			
0830-0900 fas/vl	Italy, IRRS	7120va			
0830-0900	Netherlands, Radio	5965pa	9830pa	13700pa	
0830-0900	Slovakia, R Slovakia Intl	11990as	17485au	21705au	
0830-0900	Switzerland, Swiss R Intl	9885au	12075au	13685au	
0830-0900	UK, BBC African Service	6190af	11940af	15400af	17830af
0855-0900	Guam, TWR/KTWR	15330pa			

FREQUENCIES

0900-0920 as	Albania, TWR Tirana	9685eu			
0900-1000	Anguilla,Caribbean Beacon	6090am			
0900-1000	Australia, Radio	6080as	9580pa	11880as	
0900-1000 vl	Australia, VL8A Alice Spg	2310do			
0900-1000 vl	Australia, VL8K Katherine	2485do			
0900-1000 vl	Australia, VL8T Tent Crk	2325do			
0900-1000	Canada, CFRX Toronto	6070do			
0900-1000	Canada, CFVP Calgary	6030do			
0900-1000	Canada, CHNX Halifax	6130do			
0900-1000	Canada, CKZU Vancouver	6160do			
0900-1000	China, China Radio Intl	9785pa	11755pa		
0900-1000	Costa Rica,RF Peace Intl	6980am	7385am		
0900-1000	Ecuador, HCJB	5865eu	9640pa	21455au	
0900-1000 as	Eqt Guinea, R East Africa	15186af			
0900-1000 mtwhf	Eqt Guinea, Radio Africa	15186af			
0900-0930	Finland, YLE/R Finland	9760as	15225as		
0900-0950	Germany, Deutsche Welle	6160au	7380as	9565af	12055as
		15145af	15410af	17715as	17800af
		17820as	21600af		
0900-0915 mtwtf	Ghana, Ghana Broadc Corp	3366do	4915do		
0900-1000	Guam, TWR/KTWR	15330as			
0900-0915	Guam, TWR/KTWR	15200as			
0900-1000	Guyana, GBC/Voice of	5950do			
0900-1000 fas/vl	Italy, IRRS	7120va			
0900-0930 vl	Kiribati, Radio	9810do			
0900-1000	Liberia, Radio Veritas	3425do			
0900-0915	Liberia,LCN/R Liberia Int	5100do			
0900-1000	Malaysia, Radio	7295do			
0900-0935 a	Monaco, Trans World Radio	9755eu			
0900-0950 s	Monaco, Trans World Radio	9755eu			
0900-0920 mtwhf	Monaco, Trans World Radio	9755eu			
0900-0925	Netherlands, Radio	5965pa	9830pa	13700pa	
0900-1000	New Zealand, R NZ Intl	9700pa			
0900-1000 vl	Papua New Guinea, NBC	4890do			
0900-1000	Russia,Voice of Russia WS	9825au	9835au	9875as	17495as
		17795as	17860as		
0900-1000	Singapore, SBC Radio One	6160do			
0900-1000 vl	Solomon Islands, SIBC	5020do			
0900-1000	UK, BBC African Service	6190af	11940af	15400af	17830af
		17885af			
0900-0915	UK, BBC Asian Service	6065as	6195as	9580as	9740as
		11750as	11765as	11955as	15280as
		15310as	15360as	17760as	17790as
		21660as			
0900-1000	UK, BBC World Service	9410eu	11760me	12095eu	15190sa
		15485eu	15565eu	15575as	17640eu
		17705af			
0900-1000	USA, KAIJ Dallas TX	5810am			
0900-0959	USA, KHBI N Mariana Is	9355as			
0900-1000	USA, KTBN Salt Lk City UT	7510am			
0900-1000	USA, KWHR Naalehu HI	11565pa			
0900-1000	USA, WEWN Birmingham AL	5825eu			
0900-1000	USA, WHRI Noblesville IN	5770am	7315am		
0900-1000	USA, WJCR Upton KY	7490na			
0900-1000	USA, WMLK Bethel PA	9465am			
0900-0959 th	USA, WSHB Cypress Crk SC	7535eu			
0900-1000	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
0900-1000	Zambia, Christian Voice	6065af			
0900-1000 vl	Zambia, R Zambia/ZNBC 1	7220do			
0900-1000 vl	Zimbabwe, Zimbabwe BC	5975do			
0903-0910 mtwhf	Croatia, Croatian Radio	6175eu	7185eu	11730au	
0915-1000	Ghana, Ghana Broadc Corp	6130do	7295do		
0915-0945	UK, BBC Asian Service	6065as	6195as	7235as	9580as
		9740as	11750as	11765as	11955as
		15280as	15360as	21660as	
0915-0945 as	UK, BBC Asian Service	6065as	6195as	7235as	9580as
		9740as	11765as	11955as	15280as
		15360as	21660as		
0915-0930	UK, BBC World Service	11680eu	13745eu	15325eu	15340eu
		17695eu			
0930-1000	Austria, R Austria Intl	15455as	17870au		
0930-1000	Canada, CKZN St John's	6160do			
0930-1000	Georgia, Georgian Radio	11910eu			
0930-1000	Italy, AWR Europe	7230eu			
0930-1000	Lithuania, Radio Vilnius	9710eu			
0930-1000 s/vl	Malta, VO Mediterranean	9660eu			
0930-1000	Netherlands, Radio	7260as	9810as		
0930-1000	Philippines, FEBC/R Intl	11635as			
0930-1000 as	Slovakia, AWR Europe	9450eu			
0935-0950 s	Albania, TWR Tirana	9685eu			
0945-1000	UK, BBC Asian Service	6195as	9740as	11750as	11765as
		15360as	21660as		
0945-1000 a	UK, BBC Asian Service	6065as	7235as	9580as	11955as
		15280as			
0945-1000 smtwhf	UK, BBC Slow Speed News	6065as	7235as	9580as	11955as
		15280as			
1000-1100	Anguilla,Caribbean Beacon	6090am			
1000-1030 s	Armenia, Voice of	4810eu	15270eu		
1000-1100	Australia, Radio	6080as	9580pa	11880as	
1000-1100 vl	Australia, VL8A Alice Spg	2310do			
1000-1100 vl	Australia, VL8K Katherine	2485do			
1000-1100 vl	Australia, VL8T Tent Crk	2325do			
1000-1100 vl	Canada, CBC N Quebec Svc	9625do			
1000-1100	Canada, CFRX Toronto	6070do			
1000-1100	Canada, CFVP Calgary	6030do			
1000-1100	Canada, CHNX Halifax	6130do			
1000-1100	Canada, CKZN St John's	6160do			
1000-1100	Canada, CKZU Vancouver	6160do			
1000-1100	China, China Radio Intl	9785pa	11755pa		
1000-1100	Costa Rica,RF Peace Intl	6980am	7385am		
1000-1030	Czech Rep, Radio Prague	17485af	21705me		
1000-1100	Ecuador, HCJB	9640pa	21455au		
1000-1100 as	Eqt Guinea, R East Africa	15186af			
1000-1100 mtwhf	Eqt Guinea, Radio Africa	15186af			
1000-1030	Guam, AWR/KSDA	7455as			
1000-1100	Guam, TWR/KTWR	9865as			
1000-1100	India, All India Radio	11585au	11735au	13700au	15050au
		17387au	17840au		
1000-1100 fas/vl	Italy, IRRS	7120va			
1000-1020 thfa	Kazakhstan, R Almaty Intl	9620eu	11840eu		
1000-1100	Liberia, Radio Veritas	3425do			
1000-1100	Malaysia, Radio	7295do			
1000-1100 vl	Malaysia, RTM Kuching	7160do			
1000-1100 vl	Malaysia,RTM KotaKinabalu	5980do			
1000-1100 s/vl	Malta, VO Mediterranean	9660eu			
1000-1100	Netherlands, Radio	7260as	9810as		
1000-1100	New Zealand, R NZ Intl	9700pa			
1000-1100	Nigeria, Voice of	7255af			
1000-1100 vl	Papua New Guinea, NBC	4890do			
1000-1100	Philippines, FEBC/R Intl	11635as			
1000-1100	Singapore, SBC Radio One	6160do			
1000-1100 vl	Solomon Islands, SIBC	5020do			
1000-1100	UK, BBC African Service	6190af	11940af	17885af	
1000-1100 as	UK, BBC African Service	15400af	17830af		
1000-1100	UK, BBC Asian Service	6195as	9740as	11750as	11765as
		15310as	15360as	17790as	21660as
1000-1100	UK, BBC World Service	9410eu	11760me	12095eu	15485eu
		15565eu	15575as	17640eu	17705af
1000-1100 as	UK, BBC World Service	15190sa			
1000-1100	USA, KAIJ Dallas TX	5810am			
1000-1059	USA, KHBI N Mariana Is	9355au	15725as		
1000-1100	USA, KTBN Salt Lk City UT	7510am			
1000-1100	USA, KWHR Naalehu HI	11565pa			
1000-1100	USA, Voice of America	5985pa	6165am	7405am	9590am
		11720pa	15425pa		
1000-1100	USA, WEWN Birmingham AL	5825na	7465eu		
1000-1100	USA, WGTG McCaysville GA	9400am			
1000-1100	USA, WHRI Noblesville IN	6040am	9495am		
1000-1100	USA, WJCR Upton KY	7490na			
1000-1100	USA, WRNO New Orleans LA	15420am			
1000-1059 mwh	USA, WSHB Cypress Crk SC	6095na			
1000-1059 s	USA, WSHB Cypress Crk SC	7395am			
1000-1100	USA, WWCR Nashville TN	2390am	3210am	5070am	5935am
1000-1100	USA, WYFR Okeechobee FL	5950na			
1000-1025	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as			
1000-1100	Zambia, Christian Voice	6065af			
1000-1100 vl	Zambia, R Zambia/ZNBC 1	7220do			
1020-1040 thfa	Kazakhstan, R Almaty Intl	9620eu	11840eu		
1030-1100 mtwhf	Ethiopia, Radio	5990do	7110do	9705do	
1030-1100	Guam, AWR/KSDA	7455as	9530as		
1030-1100	Sri Lanka, Sri Lanka BC	11835as	15120as	17850as	
1030-1055	UAE, Radio Dubai	13675eu	15395eu	21605eu	
1045-1100 mtwhf	USA, WRMI/R Miami Intl	9955am			

Your Name in Lights!

… or at least in ink within the *Monitoring Times* Shortwave Guide. Please send us your "best catches" on the worldwide shortwave bands — QSLs, that is — and we will try to use them in future issues of *MT*. Your QSLs will be returned.

Frequencies

1100-1200	Anguilla,Caribbean Beacon	11775am			
1100-1200	Australia, Radio	6080as	9580pa		
1100-1200 vl	Australia, VL8A Alice Spg	2310do			
1100-1200 vl	Australia, VL8K Katherine	2485do			
1100-1200 vl	Australia, VL8T Tent Crk	2325do			
1100-1200	Canada, CFRX Toronto	6070do			
1100-1200	Canada, CFVP Calgary	6030do			
1100-1200	Canada, CHNX Halifax	6130do			
1100-1200	Canada, CKZN St John's	6160do			
1100-1200	Canada, CKZU Vancouver	6160do			
1100-1200	Costa Rica, Adv World R	5030am	6150am	7375am	9725am
		13750am			
1100-1200	Costa Rica,RF Peace Intl	6980am	7385am		
1100-1200	Ecuador, HCJB	12005am	15115am	21455au	
1100-1200 as	Eqt Guinea, R East Africa	15186af			
1100-1200	Eqt Guinea, Radio Africa	9530as			
1100-1150	Germany, Deutsche Welle	15370af	15410af	17780af	17800af
1100-1200	Iran, VOIRI	13605as	15084as	15230as	
1100-1200 fas/vl	Italy, IRRS	7120va			
1100-1200	Japan, R Japan/NHK World	6120na	7125na	11815as	
1100-1200	Jordan, Radio	11690eu			
1100-1200	Liberia, Radio Veritas	3425do			
1100-1110	Liberia,LCN/R Liberia Int	5100do			
1100-1200	Malaysia, Radio	7295do			
1100-1200 vl	Malaysia, RTM Kuching	7160do			
1100-1200 vl	Malaysia,RTM KotaKinabalu	5980do			
1100-1200 s/vl	Malta, VO Mediterranean	9660eu			
1100-1125	Mozambique, R Maputo	11835do			
1100-1125	Netherlands, Radio	7260as	9810as		
1100-1200	New Zealand, R NZ Intl	9700pa			
1100-1157	North Korea, R Pyongyang	3560af	9640af	9975af	11335af
		13650af	15230af		
1100-1130 as	Palau, KHBN/Voice of Hope	9965as			
1100-1200 vl	Papua New Guinea, NBC	4890do			
1100-1200	Singapore,R Singapore Int	6015as	6155as		
1100-1130 vl	Solomon Islands, SIBC	5020do			
1100-1130	Sri Lanka, Sri Lanka BC	11835as	15120as	17850as	
1100-1130	Switzerland, Swiss R Intl	6165eu	9535eu		
1100-1200	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1100-1200	Taiwan, Voice of Asia	7445as			
1100-1200	UK, BBC African Service	6190af	11940af	15400af	17830af
		17885af	21660af		
1100-1130	UK, BBC Asian Service	7235as	9580as	9700pa	9740as
	11750as 11765as	11955as	15310as	17790as	
1100-1130 mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1100-1130	UK, BBC World Service	5875eu	5965na	9410eu	9825eu
		11760me	12095eu	15485eu	15565eu
		15575as	17640eu	17705af	17790sa
1100-1130 as	UK, BBC World Service	6195am	15190sa	15220am	
1100-1200	USA, KAIJ Dallas TX	5810am			
1100-1159	USA, KHBI N Mariana Is	9355as	9385au		
1100-1200	USA, KTBN Salt Lk City UT	7510am			
1100-1200	USA, KWHR Naalehu HI	11565pa			
1100-1200	USA, Voice of America	5985as	6160as	9645as	9760as
		11705as	11720as	15425as	
1100-1200	USA, WEWN Birmingham AL	5825na	7465eu		
1100-1200	USA, WGTG McCaysville GA	9400am			
1100-1200	USA, WHRI Noblesville IN	6040am	9495am		
1100-1200	USA, WJCR Upton KY	7490na			
1100-1200	USA, WRNO New Orleans LA	15420am			
1100-1159 wf	USA, WSHB Cypress Crk SC	7395am			
1100-1159 stfa	USA, WSHB Cypress Crk SC	6095na			
1100-1200	USA, WWCR Nashville TN	2390am	5070am	5935am	15685am
1100-1200	USA, WYFR Okeechobee FL	5950na	7355na		
1100-1125	Vietnam, Voice of	7285as	9730as		
1100-1200	Zambia, Christian Voice	6065af			
1100-1200 vl	Zambia, R Zambia/ZNBC 1	7220do			
1105-1120	Pakistan, Radio	11755eu	13620eu	15530eu	15550eu
		17835eu			
1115-1145	Nepal, Radio	3230do	5005do		
1115-1130	UK, BBC World Service	11805eu	13745eu	15325eu	15340eu
		17695eu			
1115-1130 mtwh	UK, BBC World Service	9750eu	11970eu		
1130-1200 vl	China, China Radio Intl	6995as	8660as	11445as	11700as
		15480as			
1130-1157	Czech Rep, Radio Prague	7345eu	9505eu		
1130-1135	Israel, Kol Israel	15640eu	15650na		
1130-1140	Lesotho, Radio Lesotho	4800do			
1130-1200	Myanmar, Voice of	5990do			
1130-1200	Netherlands, Radio	6045eu	7190eu		
1130-1200	South Korea, R Korea Intl	9650am			
1130-1200	UK, BBC Asian Service	6195as	7235as	9580as	9740as
		11750as	11955as	15310as	
1130-1200 as	UK, BBC Asian Service	11750as	15310as		
1130-1200	UK, BBC World Service	5965na	6195am	9410eu	11760me
		12095eu	15220am	15485eu	15565eu
		15575as	17640eu	17705af	
1130-1145 mtwhfa	Vatican State, Vatican R	5883eu	9645eu	11740eu	15595va
		17550va			
1145-1200 f	Vatican State, Vatican R	15595va	17550va		

Selected Programs

Sundays

1100 Herald Broadcasting (KHBI #2/WSHB #1): Bible Lesson. See S 0000.
1125 Japan, NHK/Radio: Profile. An in-depth interview with a Japanese or foreign personality.
1128 Herald Broadcasting (KHBI #2/WSHB #1): The Christian Science Sentinel. See S 0028.
1130 Netherlands, Radio: News. See S 0030.
1138 Netherlands, Radio: Sincerely Yours. The Sunday replacement for "Happy Station" that lets the listener comment about the RN's programming.
1153 Netherlands, Radio: Sounds Interesting. Robert Chesal takes listener feedback and incorporates their ideas into the show.

Mondays

1100 Herald Broadcasting (KHBI #2): Sunday Service from the Mother Church. See S 2300.
1115 Japan, NHK/Radio: 44 Minutes. The weekday magazine program of feature reports and the popular vocal music of Japan.
1130 Netherlands, Radio: News. See S 0030.
1130 Vatican State, Vatican Radio: News. Fifteen minutes of international news.
1133 Japan, NHK/Radio: Close Up. Featuring a Japanese person of note.
1138 Netherlands, Radio: Newsline. See S 0038.
1146 Japan, NHK/Radio: News Commentary. An editorial opinion on the current news.
1151 Japan, NHK/Radio: Tumbling Dice. Focus on a topic of interest in Japan.
1153 Netherlands, Radio: Research File. A program of science and technology.

Tuesdays

1100 Herald Broadcasting (KHBI #1&2): Bible Lesson. See S 0000.
1115 Japan, NHK/Radio: 44 Minutes. See M 1115.
1128 Herald Broadcasting (KHBI #1&2): The Christian Science Sentinel. See S 0028.
1130 Netherlands, Radio: News. See S 0030.
1130 Vatican State, Vatican Radio: News. Fifteen minutes of international news.
1133 Japan, NHK/Radio: Close Up. See M 1133.
1138 Netherlands, Radio: Newsline. See S 0038.
1146 Japan, NHK/Radio: News Commentary. See M 1146.
1151 Japan, NHK/Radio: Tumbling Dice. See M 1151.
1153 Netherlands, Radio: State of the Arts. Simone Weimans and Maggie Ayre present this new arts and culture show.

Wednesdays

1100 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
1100 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
1115 Japan, NHK/Radio: 44 Minutes. See M 1115.
1128 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
1128 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
1130 Netherlands, Radio: News. See S 0030.
1130 UK, BBC London (AF): Counterpoint. See A 0130.
1130 Vatican State, Vatican Radio: News. Fifteen minutes of international news.
1133 Japan, NHK/Radio: Close Up. See M 1133.
1138 Netherlands, Radio: Newsline. See S 0038.
1146 Japan, NHK/Radio: News Commentary. See M 1146.
1151 Japan, NHK/Radio: Tumbling Dice. See M 1151.
1154 Radio Netherlands: Documentary. Belgium (25th). See F 2354.
1154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (18th). See H 1454.
1154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (4th). Part two of the four-part series.
1154 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (11th). See A 0154.

Thursdays

1100 Herald Broadcasting (KHBI #1): The Christian Science Sentinel. See S 0028.
1100 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
1115 Japan, NHK/Radio: 44 Minutes. See M 1115.
1128 Herald Broadcasting (KHBI #1): Bible Lesson. See S 0000.
1128 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
1130 Netherlands, Radio: News. See S 0030.
1130 Vatican State, Vatican Radio: News. Fifteen minutes of international news.
1133 Japan, NHK/Radio: Close Up. See M 1133.
1138 Netherlands, Radio: Newsline. See S 0038.
1145 UK, BBC London (AF): Images of Britain (5th,12th,19th). See M 0145.
1146 Japan, NHK/Radio: News Commentary. See M 1146.
1151 Japan, NHK/Radio: Tumbling Dice. See M 1151.
1153 Netherlands, Radio: Media Network. Jonathan Marks and Diana Janssen look at the world of broadcasting. Top-rated.

Fridays

1100 Herald Broadcasting (KHBI #2): The Christian Science Sentinel. See S 0028.
1100 Herald Broadcasting (WSHB #1&2): Bible Lesson. See S 0000.
1100 Japan, NHK/Radio: News. See S 1100.
1115 Japan, NHK/Radio: 44 Minutes. See M 1115.
1116 Japan, NHK/Radio: Guest Corner. See M 1116.
1128 Herald Broadcasting (KHBI #2): Bible Lesson. See S 0000.
1128 Herald Broadcasting (WSHB #1&2): The Christian Science Sentinel. See S 0028.
1130 Netherlands, Radio: News. See S 0030.
1130 Vatican State, Vatican Radio: News. Fifteen minutes of international news.
1133 Japan, NHK/Radio: Close Up. See M 1133.
1138 Netherlands, Radio: Newsline. See S 0038.
1146 Japan, NHK/Radio: News Commentary. See M 1146.
1151 Japan, NHK/Radio: Tumbling Dice. See M 1151.
1153 Netherlands, Radio: A Good Life. See M 1253.

Saturdays

1100 Herald Broadcasting (KHBI #1&2/WSHB #1&2): The Christian Science Sentinel. See S 0028.
1110 Japan, NHK/Radio: Weekend Break. A magazine program featuring stories from around Japan.
1128 Herald Broadcasting (KHBI #1&2/WSHB #1&2): Bible Lesson. See S 0000.
1130 Netherlands, Radio: News. See S 0030.
1137 Netherlands, Radio: Newsline. See S 0038.
1153 Netherlands, Radio: Weekend. See S 0053.

Frequencies

1200-1300	Algeria, R Algiers Intl	11715me	15160me		
1200-1300	Anguilla,Caribbean Beacon	11775am			
1200-1300	Australia, Radio	5870pa	6020pa	6080as	9500pa
		9580pa	9590as	9770as	
1200-1300 vl	Australia, VL8A Alice Spg	2310do			
1200-1300 vl	Australia, VL8K Katherine	2485do			
1200-1300 vl	Australia, VL8T Tent Crk	2325do			
1200-1300	Brazil, Radio Bras	15445na			
1200-1300	Bulgaria, Radio	15130eu	15290eu		
1200-1215	Cambodia, Natl Voice of	11940as			
1200-1300 vl	Canada, CBC N Quebec Svc	9625do			
1200-1300	Canada, CFRX Toronto	6070do			
1200-1300	Canada, CFVP Calgary	6030do			
1200-1300	Canada, CHNX Halifax	6130do			
1200-1300	Canada, CKZN St John's	6160do			
1200-1300	Canada, CKZU Vancouver	6160do			
1200-1229	Canada, R Canada Intl	6150as	11730as		
1200-1300	China, China Radio Intl	6950pa	7385pa	9565as	9715as
		9945as	11660as	11675as	11980as
1200-1230 vl	China, China Radio Intl	6995as	8660as	11445as	11700as
		12110as			
1200-1300	Costa Rica,RF Peace Intl	7385am	21465am		
1200-1300	Ecuador, HCJB	12005am	15115am	21455am	
1200-1300 as	Eqt Guinea, R East Africa	15186af			
1200-1300	Eqt Guinea, Radio Africa	9530as			
1200-1257	France, Radio France Intl	9805eu	11600as	13625ca	15155eu
		15195eu	15540af	17575am	
1200-1230 s	Germany, Universal Life	9710eu			
1200-1230 s	Germany, Universal Life	9710eu			
1200-1230	Iran, VOIRI	13605as	15084as	15230as	
1200-1300 fas/vl	Italy, IRRS	7120va			
1200-1300	Japan, R Japan/NHK World	6120na	7125as	11815as	
1200-1300	Jordan, Radio	11690eu			
1200-1300	Malaysia, Radio	7295do			
1200-1300 vl	Malaysia,RTM KotaKinabalu	5980do			
1200-1230 smtwh	Malta, VO Mediterranean	9660eu			
1200-1230	Mongolia, Voice of	12085au			
1200-1250	Myanmar, Voice of	5990do			
1200-1230	Netherlands, Radio	6045eu	7190eu		
1200-1206	New Zealand, R NZ Intl	9700pa			
1200-1300	Palau, KHBN/Voice of Hope	9965as			
1200-1300 vl	Papua New Guinea, NBC	4890do			
1200-1300	Singapore,R Singapore Int	6015as	6155as		
1200-1300	South Korea, R Korea Intl	7285af			
1200-1300	Taiwan, Taipei Radio Intl	7130as	9610au		
1200-1300	UK, BBC African Service	6190af	11940af	15105af	17830af
		17885af	21640af	21660af	
1200-1300	UK, BBC Asian Service	6195as	7235as	9580as	9740as
		11750as	11955as		
1200-1300 as	UK, BBC Asian Service	11750as	15310as		
1200-1215	UK, BBC Asian Service	5975as	7135as	9605as	
1200-1300	UK, BBC World Service	5965na	6195am	9410eu	9515na
		11760me	12095eu	15220am	15485eu
		15565eu	15575as	17640eu	17705eu
1200-1300	Ukraine, R Ukraine Intl	7285na	9870na	17725au	
1200-1300	USA, KAIJ Dallas TX	5810am			
1200-1259	USA, KHBI N Mariana Is	9355as	9385as		
1200-1300	USA, KTBN Salt Lk City UT	7510am			
1200-1300	USA, KWHR Naalehu HI	11565pa			
1200-1300	USA, Voice of America	6110as	6160as	9645as	9760as
		11705as	11715as	15160as	15425as
1200-1300	USA, WEWN Birmingham AL	5825na	15745eu		
1200-1300	USA, WHRI Noblesville IN	6040am	9495am		
1200-1300	USA, WJCR Upton KY	7490na			
1200-1300	USA, WRNO New Orleans LA	7395am			
1200-1259 a	USA, WSHB Cypress Crk SC	9455am			
1200-1259 mwh	USA, WSHB Cypress Crk SC	6095na			
1200-1300	USA, WWCR Nashville TN	2390am	5070am	5935am	15685am
1200-1300	USA, WYFR Okeechobee FL	5950na	7355na	11830na	11970na
1200-1230	Uzbekistan, R Tashkent	5060as	5975as	6025as	9715as
1200-1300	Zambia, Christian Voice	6065af			
1200-1300 vl	Zambia, R Zambia/ZNBC 1	7220do			
1206-1300 occsnal	New Zealand, R NZ Intl	6105pa			
1215-1300	Egypt, Radio Cairo	17595as			
1230-1300	Bangladesh, Bangla Betar	7185as	9550as		
1230-1300	Guam, AWR/KSDA	13720as			
1230-1235	India, All India Radio	4760as	4800as	4920as	
1230-1300	Italy, AWR Europe	7230eu			
1230-1300 mtwh	Malta, VO Mediterranean	9660eu			
1230-1300	Netherlands, Radio	5975eu	6045eu		
1230-1300	South Korea, R Korea Intl	9570as	9640as	13670as	
1230-1300	Sri Lanka, Sri Lanka BC	9730as	15425as		
1230-1300	Sweden, Radio	11650na	13740na	15240na	
1230-1300	Thailand, Radio	9655as	9810as	11905as	
1230-1300	UK, BBC World Service	5875eu	9635eu	9750eu	11680eu
		11840eu	11895eu	13670eu	15225eu
		15325eu	17695eu	17715eu	
1230-1300 a	USA, Voice of America	7768eu			
1230-1300	Vietnam, Voice of	5940as	7270as	7400as	9840as
		12020as			
1240-1250	Greece, Voice of	11645af			
1240-1255 smtwh	UK, BBC Slow Speed News	7140me	11765af	11820me	13660af
		15180af	15555me		

Selected Programs

Sundays

1200 China, China Radio Intl: News. See S 0300.
1213 China, China Radio Intl: Sports Beat. News from the world of sports.
1220 China, China Radio Intl: China Snapshots. A tour around cities and town in China with focus on local flavor and customs.
1225 China, China Radio Intl: Report on Developing Countries. A report on projects in the Third World.
1230 Netherlands, Radio: News. See S 0030.
1235 China, China Radio Intl: Song of the Week. A selection of the new pop music in China.
1238 Netherlands, Radio: Wide Angle. The weekend edition of Newsline produced by the current affairs team.
1245 China, China Radio Intl: Voices from Other Lands. A cultural program about the world and its people.
1254 Netherlands, Radio: Siren Song. Dheera Sujan presents an in-depth current affairs story that will capture and hold your attention.

Mondays

1200 China, China Radio Intl: News. See S 0300.
1211 China, China Radio Intl: News about China. See S 0311.
1220 China, China Radio Intl: Current Affairs. An in-depth look at events and happenings in China.
1225 China, China Radio Intl: Press Clippings. Several items from the Chinese press.
1225 Netherlands, Radio: Press Review. Rob Green summarizes items in the Dutch media.
1230 China, China Radio Intl: China's Open Windows. Focus on a particular area of investment in China.
1230 Netherlands, Radio: News. See S 0030.
1234 China, China Radio Intl: Changzhou Reports. A look at this industrial city in East China's Jiangsu Province and the people who live and work there.
1238 Netherlands, Radio: Newsline. See S 0038.
1245 China, China Radio Intl: Idioms and Their Stories. A regular feature for students studying Chinese.
1253 Netherlands, Radio: A Good Life. Ginger da Silva hosts a program about development in both rich and poor countries.

Tuesdays

1200 China, China Radio Intl: News. See S 0300.
1220 China, China Radio Intl: Current Affairs. See M 1220.
1225 Netherlands, Radio: Press Review. See M 1225.
1230 Netherlands, Radio: News. See S 0030.
1234 China, China Radio Intl: Press Clippings. See M 1225.
1238 Netherlands, Radio: Newsline. See S 0038.
1239 China, China Radio Intl: Orient Arena. Focus on sporting events and Chinese sports personalities.
1245 China, China Radio Intl: Voices from Other Lands. See S 1245.
1253 Netherlands, Radio: Music 52-15. Martha Hawley hosts this program of international music.

Wednesdays

1200 China, China Radio Intl: News. See S 0300.
1220 China, China Radio Intl: Current Affairs. See M 1220.
1225 Netherlands, Radio: Press Review. See M 1225.
1230 Netherlands, Radio: News. See S 0030.
1234 China, China Radio Intl: Press Clippings. See M 1225.
1238 China, China Radio Intl: Profile. The activities of an interesting individual are examined.
1238 Netherlands, Radio: Newsline. See S 0038.
1245 China, China Radio Intl: Learn to Speak Chinese. Chinese language lessons for English speakers.
1253 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

1200 China, China Radio Intl: News. See S 0300.
1215 China, China Radio Intl: News Analysis. Background on current news events.
1220 China, China Radio Intl: Current Affairs. See M 1220.
1225 Netherlands, Radio: Press Review. See M 1225.
1230 Netherlands, Radio: News. See S 0030.
1230 UK, BBC London (AS): Counterpoint. See A 0130.
1234 China, China Radio Intl: Press Clippings. See M 1225.
1238 China, China Radio Intl: Focus. Looking at an issue of significance to China's development.
1238 Netherlands, Radio: Newsline. See S 0038.
1244 China, China Radio Intl: Cultural Spectrum. The rich cultural heritage of China in literature, music and art.
1253 Netherlands, Radio: Research File. See M 1153.

Fridays

1200 China, China Radio Intl: News. See S 0300.
1220 China, China Radio Intl: Current Affairs. See M 1220.
1225 Netherlands, Radio: Press Review. See M 1225.
1230 Herald Broadcasting (KHBI #1): Bible Lesson. See S 0000.
1230 Netherlands, Radio: News. See S 0030.
1233 China, China Radio Intl: Press Clippings. See M 1225.
1237 China, China Radio Intl: Life in China. Focus on an aspect of everyday living.
1238 Netherlands, Radio: Newsline. See S 0038.
1244 China, China Radio Intl: Global Review. News about developing nations.
1254 Radio Netherlands: Documentary. Belgium (27th). See F 2354.
1254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (20th). See H 1454.
1254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (6th). See W 1154.
1254 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (13th). See A 0154.

Saturdays

1200 China, China Radio Intl: News. See S 0300.
1220 China, China Radio Intl: Chinese Folktales. See S 0320.
1225 China, China Radio Intl: The Cooking Show. See S 0325.
1225 Netherlands, Radio: Insight. See S 0025.
1230 China, China Radio Intl: China Scrapbook. See S 0330.
1230 Netherlands, Radio: News. See S 0030.
1235 China, China Radio Intl: Music from China. See S 0335.
1238 Netherlands, Radio: Newsline. See S 0038.
1254 Netherlands, Radio: Roughly Speaking. See S 0153.

Frequencies

1300-1400	Anguilla,Caribbean Beacon	11775am			
1300-1400	Australia, Radio	5870pa	5995pa	6020pa	6080as
		9500pa	9580pa	9770as	
1300-1400 vl	Australia, VL8A Alice Spg	2310do			
1300-1400 vl	Australia, VL8K Katherine	2485do			
1300-1400 vl	Australia, VL8T Tent Crk	2325do			
1300-1325 s	Belgium, R Vlaanderen Int	13680na			
1300-1320	Brazil, Radio Bras	15445na			
1300-1400 vl	Canada, CBC N Quebec Svc	9625do			
1300-1400	Canada, CFRX Toronto	6070do			
1300-1400	Canada, CFVP Calgary	6030do			
1300-1400	Canada, CHNX Halifax	6130do			
1300-1400	Canada, CKZN St John's	6160do			
1300-1400	Canada, CKZU Vancouver	6160do			
1300-1330	Canada, R Canada Intl	9640na	11855na		
1300-1400	China, China Radio Intl	6140as	7385pa	9945as	11660as
		11675as	11980as		
1300-1400	Costa Rica,RF Peace Intl	7385am	21465am		
1300-1400 vl	Cyprus, BRT International	6150do			
1300-1400	Ecuador, HCJB	12005am	15115am	21455am	
1300-1330	Egypt, Radio Cairo	17595as			
1300-1400	Eqt Guinea, R East Africa	15186af			
1300-1400	Eqt Guinea, Radio Africa	9530as			
1300-1400 fas/vl	Italy, IRRS	7120va			
1300-1400	Jordan, Radio	11690eu			
1300-1400	Liberia, Radio Veritas	3425do			
1300-1310	Liberia,LCN/R Liberia Int	5100do			
1300-1400	Malaysia, Radio	7295do			
1300-1400 vl	Malaysia, RTM Kuching	7160do			
1300-1400 vl	Malaysia,RTM KotaKinabalu	5980do			
1300-1330 s/vl	Malta, VO Mediterranean	9660eu			
1300-1325	Netherlands, Radio	5975eu	6045eu		
1300-1400 occsnal	New Zealand, R NZ Intl	6105pa			
1300-1330 s	Norway, Radio Norway Intl	9590eu	9905as	13790am	13800va
1300-1400	Palau, KHBN/Voice of Hope	9985as			
1300-1400 vl	Papua New Guinea, NBC	4890do			
1300-1400	Philippines, FEBC/R Intl	11995as			
1300-1400	Poland, Polish R Warsaw	6095eu	7145eu	7270eu	9525eu
		11815eu			
1300-1356	Romania, R Romania Intl	15250eu	15390eu	17735eu	17745eu
1300-1400 as	S Africa, Channel Africa	9440af	17675af	17870af	
1300-1400	Singapore,R Singapore Int	6015as	6155as		
1300-1400	Sri Lanka, Sri Lanka BC	9730as	15425as		
1300-1330	Switzerland, Swiss R Intl	6165eu	9535eu		
1300-1400	Switzerland, Swiss R Intl	7230as	7480as		
1300-1400	UK, BBC African Service	6190af	11940af	15105af	15420af
		17810af	17830af	17885af	21640af
		21660af			
1300-1400	UK, BBC Asian Service	5990as	6195as	9740as	11750as
		15310as			
1300-1400	UK, BBC World Service	5965na	6195am	9410eu	9515na
		9590na	11760me	12095eu	15220am
		15485eu	15565eu	15575as	17640eu
		17705eu			
1300-1400	USA, KAIJ Dallas TX	5810am			
1300-1359	USA, KHBI N Mariana Is	9355as	9385as		
1300-1400	USA, KNLS Anchor Point AK	7365as			
1300-1400	USA, KTBN Salt Lk City UT	7510am			
1300-1400	USA, KWHR Naalehu HI	7560pa			
1300-1400	USA, Voice of America	6160as	9645as	9760as	11705as
		11715as	15425as		
1300-1400	USA, WEWN Birmingham AL	5825na	15745eu		
1300-1400	USA, WGTG McCaysville GA	9400am			
1300-1400	USA, WHRI Noblesville IN	6040am	15105am		
1300-1400	USA, WJCR Upton KY	7490na			
1300-1400	USA, WRMI/R Miami Intl	9955am			
1300-1400	USA, WRNO New Orleans LA	7395am			
1300-1359 tf	USA, WSHB Cypress Crk SC	9455am			
1300-1359 smtwha	USA, WSHB Cypress Crk SC	6095na			
1300-1400	USA, WWCR Nashville TN	5070am	5935am	7435am	15685am
1300-1400	USA, WYFR Okeechobee FL	5950na	11830na	11970na	13695na
1300-1400	Zambia, Christian Voice	6065af			
1300-1400 vl	Zambia, R Zambia/ZNBC 1	7220do			
1303-1310	Croatia, Croatian Radio	6175eu	7185eu		
1330-1355	Austria, R Austria Intl	6155eu	13730na		
1330-1359	Canada, R Canada Intl	6150as	9535as	9640na	11855na
1330-1400	China, Heilongjiang PBS	4840do			
1330-1400	Finland, YLE/R Finland	11735na	15400na		
1330-1400	Guam, AWR/KSDA	9650as	13720as		
1330-1400	India, All India Radio	9545as	11620as	13710as	
1330-1400	Netherlands, Radio	9895as	13700as	15585as	
1330-1400	Serbia, Radio Yugoslavia	11835au			
1330-1400	Sweden, Radio	9705as	13740au		
1330-1400	Turkey, Voice of	9630as	15290as		
1330-1355	UAE, Radio Dubai	13630eu	13675eu	15395eu	17825eu
		21605eu			
1330-1400	Uzbekistan, R Tashkent	5060as	5975as	6025as	9715as
1330-1355	Vietnam, Voice of	5940eu	7270eu	7400eu	9840as
		12020eu			
1335-1345	Greece, Voice of	9420eu	9690na	15175na	15630na
1345-1400	Vatican State, Vatican R	13765au	15540au		
1350-1400	South Korea, KBS-1	3930do			

Selected Programs

Sundays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1313 China, China Radio Intl: Sports Beat. See S 1213.
1320 China, China Radio Intl: China Snapshots. See S 1220.
1325 China, China Radio Intl: Report on Developing Countries. See S 1225.
1330 Netherlands, Radio: News. See S 0030.
1335 China, China Radio Intl: Song of the Week. See S 1235.
1337 Netherlands, Radio: Sincerely Yours. See S 1138.
1345 China, China Radio Intl: Voices from Other Lands. See S 1245.
1355 Netherlands, Radio: Sounds Interesting. See S 1153.

Mondays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1320 China, China Radio Intl: Current Affairs. See M 1220.
1325 China, China Radio Intl: Press Clippings. See M 1225.
1330 China, China Radio Intl: China's Open Windows. See M 1230.
1330 Netherlands, Radio: News. See S 0030.
1334 China, China Radio Intl: Changzhou Reports. See M 1234.
1338 Netherlands, Radio: Newsline. See S 0038.
1345 China, China Radio Intl: Idioms and Their Stories. See M 1245.
1353 Netherlands, Radio: Research File. See M 1153.

Tuesdays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1320 China, China Radio Intl: Current Affairs. See M 1220.
1330 Netherlands, Radio: News. See S 0030.
1334 China, China Radio Intl: Press Clippings. See M 1225.
1338 Netherlands, Radio: Newsline. See S 0038.
1339 China, China Radio Intl: Orient Arena. See T 1239.
1345 China, China Radio Intl: Voices from Other Lands. See S 1245.
1354 Netherlands, Radio: State of the Arts. See T 1153.

Wednesdays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1320 China, China Radio Intl: Current Affairs. See M 1220.
1330 Netherlands, Radio: News. See S 0030.
1334 China, China Radio Intl: Press Clippings. See M 1225.
1338 China, China Radio Intl: Profile. See W 1238.
1338 Netherlands, Radio: Newsline. See S 0038.
1345 China, China Radio Intl: Learn to Speak Chinese. See W 1245.
1354 Radio Netherlands: Documentary. Belgium (25th). See F 2354.
1354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (18th). See H 1454.
1354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (4th). See W 1154.
1354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (11th). See A 0154.

Thursdays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1315 China, China Radio Intl: News Analysis. See H 1215.
1320 China, China Radio Intl: Current Affairs. See M 1220.
1330 Netherlands, Radio: News. See S 0030.
1334 China, China Radio Intl: Press Clippings. See M 1225.
1338 China, China Radio Intl: Focus. See H 1238.
1338 Netherlands, Radio: Newsline. See S 0038.
1344 China, China Radio Intl: Cultural Spectrum. See H 1244.
1352 Netherlands, Radio: Media Network. See H 1153.

Fridays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1320 China, China Radio Intl: Current Affairs. See M 1220.
1330 Netherlands, Radio: News. See S 0030.
1333 China, China Radio Intl: Press Clippings. See M 1225.
1337 China, China Radio Intl: Life in China. See F 1237.
1338 Netherlands, Radio: Newsline. See S 0038.
1344 China, China Radio Intl: Global Review. See F 1244.
1355 Netherlands, Radio: A Good Life. See M 1253.

Saturdays

1300 China, China Radio Intl: News. See S 0300.
1311 China, China Radio Intl: News about China. See S 0311.
1320 China, China Radio Intl: Chinese Folktales. See S 0320.
1325 China, China Radio Intl: The Cooking Show. See S 0325.
1330 China, China Radio Intl: China Scrapbook. See S 0330.
1330 Netherlands, Radio: News. See S 0030.
1335 China, China Radio Intl: Music from China. See S 0335.
1338 Netherlands, Radio: Newsline. See S 0038.
1355 Netherlands, Radio: Weekend. See S 0053.

Frequencies

1400-1500	Anguilla,Caribbean Beacon	11775am			
1400-1500	Australia, Radio	5995pa	6020pa	6080as	9500as
		9590as	9770as	11660as	
1400-1500 vl	Australia, VL8A Alice Spg	2310do			
1400-1500 vl	Australia, VL8K Katherine	2485do			
1400-1500 vl	Australia, VL8T Tent Crk	2325do			
1400-1500 vl	Canada, CBC N Quebec Svc	9625do			
1400-1500	Canada, CFRX Toronto	6070do			
1400-1500	Canada, CFVP Calgary	6030do			
1400-1500	Canada, CHNX Halifax	6130do			
1400-1500	Canada, CKZN St John's	6160do			
1400-1500	Canada, CKZU Vancouver	6160do			
1400-1430 smtwhf	Canada, R Canada Intl	9640na	11855na		
1400-1500	China, China Radio Intl	7160as	7260as	7405na	9535as
		9700va	11825as		
1400-1500	Costa Rica,RF Peace Intl	7385am	21465am		
1400-1430	Czech Rep, Radio Prague	13580na	21700af		
1400-1500	Ecuador, HCJB	12005am	15115am	21455am	
1400-1500 as	Eqt Guinea, R East Africa	15186af			
1400-1457	France, Radio France Intl	7110as	11910as	12030as	15405as
		17560me			
1400-1500 vl	Georgia, Voice of Hope	9310as			
1400-1500	India, All India Radio	9545as	11620as	13710as	
1400-1500 fas/vl	Italy, IRRS	7120va			
1400-1500	Japan, R Japan/NHK World	7200as			
1400-1500	Jordan, Radio	11690eu			
1400-1500	Liberia, Radio Veritas	3425do			
1400-1500	Malaysia, Radio	7295do			
1400-1500	Malaysia, RTM Kuching	7160do			
1400-1500 vl	Malaysia,RTM KotaKinabalu	5980do			
1400-1500	Netherlands, Radio	9895as	13700as	15585as	
1400-1500 occsnal	New Zealand, R NZ Intl	6105pa			
1400-1430 s	Norway, Radio Norway Intl	13800as			
1400-1500 as	Palau, KHBN/Voice of Hope	9985as			
1400-1500 vl	Papua New Guinea, NBC	4890do			
1400-1500	Philippines, FEBC/R Intl	11995as			
1400-1500	Russia,Voice of Russia WS	7130me	7390as	9450as	9470me
		9840me	11695as		
1400-1455 as	S Africa, Channel Africa	9440af	17675af	17870af	
1400-1500	Singapore, SBC Radio One	6155do			
1400-1500	Sri Lanka, Sri Lanka BC	9730as	15425as		
1400-1500	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1400-1430	Thailand, Radio	9530as	9655as	11905as	
1400-1430	Turkey, Voice of	9630as	15290as		
1400-1410 thfs	Turkmenistan, Turkmen R	5015eu			
1400-1500	UK, BBC African Service	6190af	11860af	11940af	15420af
		17830af	17885af	21470af	21490af
		21660af			
1400-1500	UK, BBC Asian Service	5990as	6195as	9740as	11750as
1400-1500	UK, BBC World Service	9410eu	9515na	9590na	12095eu
		15220na	15485eu	15565eu	15575as
		17640eu	17705eu	17840am	
1400-1500	USA, KAIJ Dallas TX	13815am			
1400-1459	USA, KHBI N Mariana Is	9355af			
1400-1500	USA, KJES Mesquite NM	11715na			
1400-1500	USA, KTBN Salt Lk City UT	7510am			
1400-1500	USA, KWHR Naalehu HI	7560pa			
1400-1500	USA, Voice of America	6160as	7125as	7215as	9645as
		9760as	11705as	15205as	15395as
		15425as			
1400-1500	USA, WEWN Birmingham AL	9455na	11875na	15745eu	
1400-1500	USA, WGTG McCaysville GA	9400am			
1400-1500	USA, WHRI Noblesville IN	6040am	15105am		
1400-1500	USA, WJCR Upton KY	7490na			
1400-1500	USA, WRMI/R Miami Intl	9955am			
1400-1500	USA, WRNO New Orleans LA	7395am			
1400-1500	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1400-1500	USA, WYFR Okeechobee FL	5950na	11830na	17760ca	
1400-1405	Vatican State, Vatican R	13765au	15540au		
1400-1500	Zambia, Christian Voice	6065af			
1400-1500 vl	Zambia, R Zambia/ZNBC 1	4910do			
1415-1420	Nepal, Radio	3230do	5005do		
1430-1500	Canada, R Canada Intl	9555va	11915eu	11935va	15325va
1430-1500 smtwhf	Canada, R Canada Intl	9640na	11855na		
1430-1500 vl	China, China Radio Intl	6995as	8660as	9880as	11445as
1430-1500	Guam, AWR/KSDA	7400as			
1430-1500 mtwhf	Portugal, R Portugal Intl	21515as			
1430-1500	Sweden, Radio	11650au	11880as	15240au	
1430-1445 mtwhf	USA, WRMI/R Miami Intl	9955am			
1430-1500 vl	Zambia, R Zambia/ZNBC 2	6165do			
1440-1500	Myanmar, Voice of	5990do			
1450-1500	Vatican State, Vatican R	9875au	11640au		

Selected Programs

Sundays

1400 China, China Radio Intl: News. See S 0300.
1411 Russia, Voice of: Sunday Panorama. A magazine program focusing on life and times in Russia.
1413 China, China Radio Intl: Sports Beat. See S 1213.
1420 China, China Radio Intl: China Snapshots. See S 1220.
1425 China, China Radio Intl: Report on Developing Countries. See S 1225.
1430 Netherlands, Radio: News (daily). See S 0030.
1432 Russia, Voice of: Your Top Tune. See S 0332.
1435 China, China Radio Intl: Song of the Week. See S 1235.
1439 Netherlands, Radio: Wide Angle. See S 1238.
1445 China, China Radio Intl: Voices from Other Lands. See S 1245.
1447 Russia, Voice of: You Write to Moscow. See S 0347.
1454 Netherlands, Radio: Siren Song. See S 1254.

Mondays

1400 China, China Radio Intl: News. See S 0300.
1411 Russia, Voice of: News and Views (Mon-Sat). See S 0411.
1420 China, China Radio Intl: Current Affairs. See M 1220.
1425 China, China Radio Intl: Press Clippings. See M 1225.
1425 Netherlands, Radio: Press Review. See M 1225.
1430 China, China Radio Intl: China's Open Windows. See M 1230.
1432 Russia, Voice of: Audio Book Club. See M 0432.
1434 China, China Radio Intl: Changzhou Reports. See M 1234.
1438 Netherlands, Radio: Newsline. See S 0038.
1445 China, China Radio Intl: Idioms and Their Stories. See M 1245.
1445 UK, BBC London (AS): Images of Britain (2nd,9th,16th). See M 0145.
1454 Netherlands, Radio: A Good Life. See M 1253.

Tuesdays

1400 China, China Radio Intl: News. See S 0300.
1420 China, China Radio Intl: Current Affairs. See M 1220.
1425 Netherlands, Radio: Press Review. See M 1225.
1432 Russia, Voice of: Kaleidoscope. See S 1532.
1434 China, China Radio Intl: Press Clippings. See M 1225.
1438 Netherlands, Radio: Newsline. See S 0038.
1439 China, China Radio Intl: Orient Arena. See T 1239.
1445 China, China Radio Intl: Voices from Other Lands. See S 1245.
1454 Netherlands, Radio: Music 52-15. See T 1253.

Wednesdays

1400 China, China Radio Intl: News. See S 0300.
1420 China, China Radio Intl: Current Affairs. See M 1220.
1425 Netherlands, Radio: Press Review. See M 1225.
1432 Russia, Voice of: Russian by Radio. A course in the Russian language.
1434 China, China Radio Intl: Press Clippings. See M 1225.
1438 China, China Radio Intl: Profile. See W 1238.
1438 Netherlands, Radio: Newsline. See S 0038.
1445 China, China Radio Intl: Learn to Speak Chinese. See W 1245.
1454 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

1400 China, China Radio Intl: News. See S 0300.
1415 China, China Radio Intl: News Analysis. See H 1215.
1420 China, China Radio Intl: Current Affairs. See M 1220.
1425 Netherlands, Radio: Press Review. See M 1225.
1432 Russia, Voice of: Kaleidoscope. See S 1532.
1434 China, China Radio Intl: Press Clippings. See M 1225.
1438 China, China Radio Intl: Focus. See H 1238.
1438 Netherlands, Radio: Newsline. See S 0038.
1444 China, China Radio Intl: Cultural Spectrum. See H 1244.
1453 Netherlands, Radio: Research File. See M 1153.

Fridays

1400 China, China Radio Intl: News. See S 0300.
1420 China, China Radio Intl: Current Affairs. See M 1220.
1425 Netherlands, Radio: Press Review. See M 1225.
1433 China, China Radio Intl: Press Clippings. See M 1225.
1437 China, China Radio Intl: Life in China. See F 1237.
1438 Netherlands, Radio: Newsline. See S 0038.
1444 China, China Radio Intl: Global Review. See F 1244.
1446 Russia, Voice of: Russian by Radio. See W 1432.
1454 Radio Netherlands: Documentary. Belgium (27th). See F 2354.
1454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (20th). Part four of the four-part series.
1454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (6th). See W 1154.
1454 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (13th). See A 0154.

Saturdays

1400 China, China Radio Intl: News. See S 0300.
1420 China, China Radio Intl: Chinese Folktales. See S 0320.
1425 China, China Radio Intl: The Cooking Show. See S 0325.
1425 Netherlands, Radio: Insight. See S 0025.
1430 China, China Radio Intl: China Scrapbook. See S 0330.
1432 Russia, Voice of: A Christian Message from Moscow. See S 0432.
1435 China, China Radio Intl: Music from China. See S 0335.
1438 Netherlands, Radio: Newsline. See S 0038.
1454 Netherlands, Radio: Roughly Speaking. See S 0153.

Hausers Highlights
Iceland: Rikisutvarpid

1215-1300	Eu	11402, 13860
1410-1440	Am	11402, 13860
1855-1930	Eu	5055, 7735
1935-2010	Am	11502, 13860
2300-2335	Am	9275, 11402

(via Bernhard Klink, *BC-DX*)

Frequencies

1500-1600	Anguilla,Caribbean Beacon	11775am			
1500-1600	Australia, Radio	5995pa	6020pa	6080as	9500as
		9590as	9770as	11660as	
1500-1600 vl	Australia, VL8A Alice Spg	2310do			
1500-1600 vl	Australia, VL8K Katherine	2485do			
1500-1600 vl	Australia, VL8T Tent Crk	2325do			
1500-1600 vl	Canada, CBC N Quebec Svc	9625do			
1500-1600	Canada, CFRX Toronto	6070do			
1500-1600	Canada, CFVP Calgary	6030do			
1500-1600	Canada, CHNX Halifax	6130do			
1500-1600	Canada, CKZN St John's	6160do			
1500-1600	Canada, CKZU Vancouver	6160do			
1500-1600 s	Canada, R Canada Intl	9640na	11855na		
1500-1600	China, China Radio Intl	7160as	7405na	9785as	
1500-1600	Costa Rica,RF Peace Intl	7385am	15050am	21465am	
1500-1600	Ecuador, HCJB	12005am	15115am	21455am	
1500-1600 as	Eqt Guinea, R East Africa	15186af			
1500-1530 vl	Georgia, Voice of Hope	9310as			
1500-1600	Guam, TWR/KTWR	15105as			
1500-1530	Israel, Kol Israel	9365eu	12080na		
1500-1600 fas/vl	Italy, IRRS	7120va			
1500-1600	Japan, R Japan/NHK World	7200as	7240as	9535na	9750as
		11730as	15355af		
1500-1600	Jordan, Radio	11690eu			
1500-1600	Liberia, Radio Veritas	3425do			
1500-1510	Liberia,LCN/R Liberia Int	5100do			
1500-1600	Malaysia, Radio	7295do			
1500-1600	Malaysia, RTM Kuching	7160do			
1500-1600 vl	Malaysia,RTM KotaKinabalu	5980do			
1500-1530	Mexico, Radio Mexico Intl	9705na			
1500-1530	Mongolia, Voice of	9720as	12085as		
1500-1515 s	Myanmar, Voice of	5990do			
1500-1525	Netherlands, Radio	9895as	13700as	15585as	
1500-1600 occsnal	New Zealand, R NZ Intl	6105pa			
1500-1600	Nigeria, Voice of	7255af			
1500-1600	North Korea, R Pyongyang	3560eu	9640af	9975eu	11335eu
		11735eu	13650me		
1500-1530 as	Palau, KHBN/Voice of Hope	9985as			
1500-1600 vl	Papua New Guinea, NBC	4890do			
1500-1600	Philippines, FEBC/R Intl	11995as			
1500-1600	Russia,Voice of Russia WS	4730as	4940as	4975as	5925me
		7115af	7130me	7235as	7245me
		9470af	9635me	9830me	9840me
1500-1530	S Africa, Channel Africa	9440af			
1500-1530 twhfa	Seychelles, FEBA Radio	11600as			
1500-1545 sm	Seychelles, FEBA Radio	11600as			
1500-1558 mtwhfa	Seychelles, FEBA Radio	9810as			
1500-1600	Singapore, SBC Radio One	6155do			
1500-1600	Sri Lanka, Sri Lanka BC	9730as	15425as		
1500-1530	UK, BBC African Service	6190af	11860af	11940af	15400af
		15420af	17830af	21470af	21490af
		21660af			
1500-1600	UK, BBC Asian Service	5975as	5990as	9740as	9815as
		11750as	11780as		
1500-1600	UK, BBC World Service	5875eu	6195eu	9410eu	9515na
		9590na	12040eu	12095eu	15220na
		15485eu	15575eu	17705eu	17840am
1500-1600	USA, KAIJ Dallas TX	13815am			
1500-1600	USA, KTBN Salt Lk City UT	7510am			
1500-1600	USA, KWHR Naalehu HI	7560as	9930as		
1500-1600	USA, Voice of America	6110as	6160as	7125as	7215as
		9575as	9645as	9760as	15205as
		15395as			
1500-1600	USA, WEWN Birmingham AL	9455na	11875na	15745eu	
1500-1600	USA, WGTG McCaysville GA	9400am			
1500-1600	USA, WHRI Noblesville IN	13760am	15105am		
1500-1600	USA, WJCR Upton KY	7490na			
1500-1600	USA, WRNO New Orleans LA	7395am			
1500-1600	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1500-1600	USA, WYFR Okeechobee FL	11830na	17760ca		
1500-1530	Vatican State, Vatican R	9875au	11640au		
1500-1600	Zambia, Christian Voice	6065af			
1500-1600 vl	Zambia, R Zambia/ZNBC 1	4910do			
1500-1600 vl	Zambia, R Zambia/ZNBC 2	6165do			
1515-1530 vl	Cyprus, BRT International	6150do			
1530-1600	Iran, VOIRI	7215as	11790as		
1530-1600	UK, BBC African Service	6190af	11940af	15400af	17830af
		21470af	21660af		
1530-1545	UK, BBC Asian Service	7135as	11685as		
1545-1600 sh	Bangladesh, Bangla Betar	4880do			
1550-1600 a	Vatican State, Vatican R	9875va	11640va		

Selected Programs

Sundays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1513 China, China Radio Intl: Sports Beat. See S 1213.
1520 China, China Radio Intl: China Snapshots. See S 1220.
1525 China, China Radio Intl: Report on Developing Countries. See S 1225.
1532 Russia, Voice of: Kaleidoscope. A variety of topics ranging from science and ecology to cultural matters.
1535 China, China Radio Intl: Song of the Week. See S 1235.
1545 China, China Radio Intl: Voices from Other Lands. See S 1245.

Mondays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1520 China, China Radio Intl: Current Affairs. See M 1220.
1525 China, China Radio Intl: Press Clippings. See M 1225.
1530 China, China Radio Intl: China's Open Windows. See M 1230.
1532 Russia, Voice of: Folk Box. One of the top ten entertainment programs (Passport to World Band Radio).
1534 China, China Radio Intl: Changzhou Reports. See M 1234.
1545 China, China Radio Intl: Idioms and Their Stories. See M 1245.

Tuesdays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1520 China, China Radio Intl: Current Affairs. See M 1220.
1532 Russia, Voice of: Music at Your Request. Carl Watts presents music as requested by listeners.
1534 China, China Radio Intl: Press Clippings. See M 1225.
1539 China, China Radio Intl: Orient Arena. See T 1239.
1545 China, China Radio Intl: Voices from Other Lands. See S 1245.

Wednesdays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1520 China, China Radio Intl: Current Affairs. See M 1220.
1532 Russia, Voice of: The Jazz Show. See M 0532.
1534 China, China Radio Intl: Press Clippings. See M 1225.
1538 China, China Radio Intl: Profile. See W 1238.
1545 China, China Radio Intl: Learn to Speak Chinese. See W 1245.

Thursdays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1515 China, China Radio Intl: News Analysis. See H 1215.
1520 China, China Radio Intl: Current Affairs. See M 1220.
1532 Russia, Voice of: Yours for the Asking. See T 0532.
1534 China, China Radio Intl: Press Clippings. See M 1225.
1538 China, China Radio Intl: Focus. See H 1238.
1544 China, China Radio Intl: Cultural Spectrum. See H 1244.

Fridays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1520 China, China Radio Intl: Current Affairs. See M 1220.
1532 Russia, Voice of: Music at Your Request. See T 1532.
1533 China, China Radio Intl: Press Clippings. See M 1225.
1537 China, China Radio Intl: Life in China. See F 1237.
1544 China, China Radio Intl: Global Review. See F 1244.

Saturdays

1500 China, China Radio Intl: News. See S 0300.
1500 Russia, Voice of: News. See S 0200.
1511 China, China Radio Intl: News about China. See S 0311.
1511 Russia, Voice of: Moscow Mailbag. See S 0311.
1520 China, China Radio Intl: Chinese Folktales. See S 0320.
1525 China, China Radio Intl: The Cooking Show. See S 0325.
1530 China, China Radio Intl: China Scrapbook. See S 0330.
1532 Russia, Voice of: Timelines. See M 0332.
1535 China, China Radio Intl: Music from China. See S 0335.

Frequencies

1600-1700	Anguilla,Caribbean Beacon	11775am			
1600-1700	Australia, Radio	5870pa	5995pa	6020pa	6080as
		9415pa	9500as	9590as	9770as
		11660as			
1600-1700 vl	Australia, VL8A Alice Spg	2310do			
1600-1700 vl	Australia, VL8K Katherine	2485do			
1600-1700 vl	Australia, VL8T Tent Crk	2325do			
1600-1610	Bangladesh, Bangla Betar	4880do	15520do		
1600-1700 vl	Canada, CBC N Quebec Svc	9625do			
1600-1700	Canada, CFRX Toronto	6070do			
1600-1700	Canada, CFVP Calgary	6030do			
1600-1700	Canada, CHNX Halifax	6130do			
1600-1700	Canada, CKZN St John's	6160do			
1600-1700	Canada, CKZU Vancouver	6160do			
1600-1630 s	Canada, R Canada Intl	9640na	11855na		
1600-1659	Canada, R Canada Intl	6140as	7150as		
1600-1700	China, China Radio Intl	9565as	9620af		
1600-1700 as	Costa Rica, Adv World R	9725am	11870am	13750am	
1600-1700	Ethiopia, Radio	7165af	9560af		
1600-1700	France, Radio France Intl	9485af	11615af	11700af	12015af
		15210af	15315af	15530af	
1600-1630 vl	Georgia, Voice of Hope	12120as			
1600-1650	Germany, Deutsche Welle	6170as	7120af	7225as	7305as
		9585as	9735af	11810af	13750as
		15145af			
1600-1700	Germany,Overcomer Ministr	6175eu	11985eu		
1600-1700	Guam, AWR/KSDA	7455as			
1600-1630	GUAM, TWR/KTWR	15105as			
1600-1630	Iran, VOIRI	7215as	11790as		
1600-1700 fas/vl	Italy, IRRS	3985va			
1600-1700	Jordan, Radio	11690eu			
1600-1700	Lebanon, Voice of Hope	9960va			
1600-1610	Lesotho, Radio Lesotho	4800do			
1600-1700	Liberia, Radio Veritas	3425do			
1600-1700	Malaysia, Radio	7295do			
1600-1630	Mexico, Radio Mexico Intl	9705na			
1600-1650 occsnal	New Zealand, R NZ Intl	6105pa			
1600-1700	Nigeria, Voice of	7255af			
1600-1630 s	Norway, Radio Norway Intl	13800va	13805na		
1600-1615	Pakistan, Radio	9650af	11570me	15375me	17720me
1600-1700 vl	Papua New Guinea, NBC	4890do			
1600-1700	Russia,Voice of Russia WS	4730me	4940me	4975me	6175af
		7115af	7210af	7275af	9470af
		9505af	9585af	9635af	
1600-1700 sm	Russia,Voice of Russia WS	6005af			
1600-1625	S Africa, Channel Africa	5955af			
1600-1700	South Korea, R Korea Intl	5975eu	9515af	9870af	
1600-1700 as	Sri Lanka, Sri Lanka BC	9730as	15425as		
1600-1700	Swaziland, Trans World R	9500af			
1600-1615	Switzerland, Swiss R Intl	9885as	12075as	13635as	
1600-1638	UAE, Radio Dubai	13630au	13675eu	15395eu	21605eu
1600-1615	UK, BBC Asian Service	3915as	5975as	5990as	6195as
1600-1700	UK, BBC Asian Service	7135as	9740as	11750as	
1600-1700	UK, BBC World Service	6195eu	9410eu	9515na	12095eu
		15485eu	15575eu	17705eu	17840am
1600-1700	USA, KAIJ Dallas TX	13815am			
1600-1700	USA, KTBN Salt Lk City UT	15590am			
1600-1700	USA, KWHR Naalehu HI	7560pa	9930as		
1600-1700	USA, Voice of America	6035af	6110as	7125as	7215as
		9575as	9645as	9760as	11920af
		12040af	13600af	13710af	15205as
		15225af	15395as	15410af	15445af
		17895af			
1600-1700	USA, WEWN Birmingham AL	11875na	13615na	15745eu	
1600-1700	USA, WGTG McCaysville GA	9400am			
1600-1700	USA, WHRI Noblesville IN	13760am	15105am		
1600-1700	USA, WJCR Upton KY	7490na			
1600-1700	USA, WRNO New Orleans LA	15420am			
1600-1659 a	USA, WSHB Cypress Crk SC	18930af			
1600-1700	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1600-1700	USA, WYFR Okeechobee FL	11830na	15215na	15695eu	17555eu
		17760eu	21525af		
1600-1659 a	USA< WSHB Cypress Crk SC	18930af			
1600-1610 a	Vatican State, Vatican R	9875va	11640va		
1600-1625	Vietnam, Voice of	5940eu	7270eu	7400eu	9840af
1600-1700	Zambia, Christian Voice	3330af	4965af		
1600-1700 vl	Zambia, R Zambia/ZNBC 1	4910do			
1600-1700 vl	Zambia, R Zambia/ZNBC 2	6165do			
1610-1615	Bangladesh, Bangla Betar	4880do			
1610-1700	USA, WYFR Okeechobee FL	11550as			
1615-1630 mtwhf	Estonia, Radio Tallinn	5925eu			
1615-1700	UK, BBC African Service	6190af	11940af	15400af	15420af
		17830af	21470af	21660af	
1615-1645 as	UK, BBC African Service	11860af			
1615-1700	UK, BBC Asian Service	3915as	5975as	7135as	9510as
		9740as	11750as		
1615-1700 as	UK, BBC World Service	9515na			
1615-1630	UK, BBC World Service	6010eu	9915eu		
1630-1659 s	Canada, R Canada Intl	9640na	11855na		
1630-1700	Egypt, Radio Cairo	15255af			
1630-1700	Georgia, Georgian Radio	6080eu			
1630-1700 vl	Georgia, Voice of Hope	6290eu			
1645-1700 irreg	Afghanistan, Radio	7200as			
1645-1655	Israel, Kol Israel	9435eu	11605na		
1645-1700	Israel, Kol Israel	7465na			
1645-1700	Tajikistan,Radio Dushanbe	7245as	11620as		
1650-1700	Eqt Guinea, Radio Africa	15186af			
1650-1700 mtwhf	New Zealand, R NZ Intl	9810pa			

Selected Programs

Sundays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Program Preview. See S 0511.
1613 China, China Radio Intl: Sports Beat. See S 1213.
1620 China, China Radio Intl: China Snapshots. See S 1220.
1625 China, China Radio Intl: Report on Developing Countries. See S 1225.
1632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
1635 China, China Radio Intl: Song of the Week. See S 1235.
1645 China, China Radio Intl: Voices from Other Lands. See S 1245.

Mondays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Focus on Asia and the Pacific. News and comments on events in the region.
1620 China, China Radio Intl: Current Affairs. See M 1220.
1625 China, China Radio Intl: Press Clippings. See M 1225.
1630 China, China Radio Intl: China's Open Windows. See M 1230.
1632 Russia, Voice of: This is Russia. See S 0632.
1634 China, China Radio Intl: Changzhou Reports. See M 1234.
1645 China, China Radio Intl: Idioms and Their Stories. See M 1245.

Tuesdays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
1620 China, China Radio Intl: Current Affairs. See M 1220.
1632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
1634 China, China Radio Intl: Press Clippings. See M 1225.
1639 China, China Radio Intl: Orient Arena. See T 1239.
1645 China, China Radio Intl: Voices from Other Lands. See S 1245.

Wednesdays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
1620 China, China Radio Intl: Current Affairs. See M 1220.
1632 Russia, Voice of: This is Russia. See S 0632.
1634 China, China Radio Intl: Press Clippings. See M 1225.
1638 China, China Radio Intl: Profile. See W 1238.
1645 China, China Radio Intl: Learn to Speak Chinese. See W 1245.

Thursdays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
1615 China, China Radio Intl: News Analysis. See H 1215.
1620 China, China Radio Intl: Current Affairs. See M 1220.
1632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
1634 China, China Radio Intl: Press Clippings. See M 1225.
1638 China, China Radio Intl: Focus. See H 1238.
1644 China, China Radio Intl: Cultural Spectrum. See H 1244.

Fridays

1600 China, China Radio Intl: News. See S 0300.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Focus on Asia and the Pacific. See M 1611.
1620 China, China Radio Intl: Current Affairs. See M 1220.
1632 Russia, Voice of: Your Top Tune. See S 0332.
1633 China, China Radio Intl: Press Clippings. See M 1225.
1637 China, China Radio Intl: Life in China. See F 1237.
1644 China, China Radio Intl: Global Review. See F 1244.
1647 Russia, Voice of: You Write to Moscow. See S 0347.

Saturdays

1600 China, China Radio Intl: News. See S 0300.
1600 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
1600 Russia, Voice of: News. See S 0200.
1611 China, China Radio Intl: News about China. See S 0311.
1611 Russia, Voice of: Newmarket. This program tells where and how to invest in Russia, how to sell your product, or start a business, and news about Russia's involvement in international business.
1620 China, China Radio Intl: Chinese Folktales. See S 0320.
1625 China, China Radio Intl: The Cooking Show. See S 0325.
1630 China, China Radio Intl: China Scrapbook. See S 0330.
1630 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
1632 Russia, Voice of: Moscow Yesterday and Today. See S 0532.
1635 China, China Radio Intl: Music from China. See S 0335.

Hausers Highlights

PALAU: KHBN, Koror

V. of Hope Asia, in English:

0800-0900	9985 kHz
1100-1130	9965
1200-1300	9965
1300-1530	9985
1700-1800	9965

including partly Tagalog 1715-1745 (BBCM)

FREQUENCIES

1700-1800	Anguilla,Caribbean Beacon	11775am			
1700-1800	Australia, Radio	5870pa	5995pa	6020pa	6080pa
		9500as	9590as	9770as	11880pa
1700-1800 vl	Australia, VL8A Alice Spg	2310do			
1700-1800 vl	Australia, VL8K Katherine	2485do			
1700-1800 vl	Australia, VL8T Tent Crk	2325do			
1700-1800 vl	Canada, CBC N Quebec Svc	9625do			
1700-1800	Canada, CFRX Toronto	6070do			
1700-1800	Canada, CFVP Calgary	6030do			
1700-1800	Canada, CHNX Halifax	6130do			
1700-1800	Canada, CKZN St John's	6160do			
1700-1800	Canada, CKZU Vancouver	6160do			
1700-1800	China, China Radio Intl	5220af	7150af	7160af	7405af
		9570af	9700af		
1700-1800	Costa Rica,RF Peace Intl	15050am	21465am		
1700-1727	Czech Rep, Radio Prague	5930eu	9430af		
1700-1800	Egypt, Radio Cairo	15255af			
1700-1800	Eqt Guinea, Radio Africa	15186af			
1700-1730	France, Radio France Intl	9485af	11615af		
1700-1800 vl	Georgia, Voice of Hope	6290eu			
1700-1800	Germany,Overcomer Ministr	6175eu	11985eu		
1700-1800 vl	Italy, IRRS	3985va			
1700-1800	Japan, R Japan/NHK World	6035as	6190va	7110eu	7200as
		7225as	9535na	11730as	11880me
1700-1730	Jordan, Radio	11690eu			
1700-1800	Lebanon, Voice of Hope	9960va			
1700-1800	Liberia, Radio Veritas	3425do			
1700-1800 mtwhf	New Zealand, R NZ Intl	9810pa			
1700-1730 s	Norway, Radio Norway Intl	7560eu			
1700-1800 vl	Palau, KHBN/Voice of Hope	9965as			
1700-1800 vl	Papua New Guinea, NBC	4890do			
1700-1756	Romania, R Romania Intl	7195eu	9690eu	11940eu	
1700-1800	Russia,Voice of Russia WS	4920eu	5940eu	5965eu	6130eu
	6175af 7115af	7125eu	7175af	7180eu	7185af
	7210af 7255af	7275af	7305af	7355af	9560af
	9585me 9765eu	9880eu	9890eu	12065me	15400eu
1700-1730	S Africa, Channel Africa	15240af			
1700-1730	Slovakia, AWR Europe	7325as	9450af		
1700-1800	Swaziland, Trans World R	9500af			
1700-1800	UK, BBC African Service	6005af	6190af	9630af	11940af
		15400af	15420af	17830af	
1700-1745	UK, BBC Asian Service	3915as	5975as	7135as	9510as
		9740as	11750as		
1700-1800	UK, BBC World Service	3955eu	6095me	6180eu	6195eu
	7210eu 9410eu	9530eu	12095eu	15485eu	17840na
1700-1800	USA, KAIJ Dallas TX	13815am			
1700-1800	USA, KTBN Salt Lk City UT	15590am			
1700-1800	USA, KWHR Naalehu HI	7560pa	9930as		
1700-1800	USA, Voice of America	6040af	6110as	7125as	7215as
	9645as 9760as	11920af	12040af	15120eu	15205as
	15395as 15410af	15445af	17895af		
1700-1800 mtwhf	USA, Voice of America	5990as	6045as	9525as	9670as
	9795as 11955as	12005as	12050as	15255as	
1700-1800	USA, WEWN Birmingham AL	11875na	13615na	15745eu	
1700-1800	USA, WGTG McCaysville GA	9400am			
1700-1800	USA, WHRI Noblesville IN	13760am	15105am		
1700-1800	USA, WINB Red Lion PA	13790af			
1700-1800	USA, WJCR Upton KY	7490na			
1700-1800	USA, WMLK Bethel PA	9465am			
1700-1800	USA, WRNO New Orleans LA	15420am			
1700-1759 tha	USA, WSHB Cypress Crk SC	18930af			
1700-1800	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1700-1800	USA, WYFR Okeechobee FL	11550as	15695eu	17555eu	
1700-1800	Zambia, Christian Voice	3330af	4965af		
1700-1800 vl	Zambia, R Zambia/ZNBC 1	4910do			
1700-1800 vl	Zambia, R Zambia/ZNBC 2	6165do			
1700-1800 vl	Zimbabwe, Zimbabwe BC	4828do			
1715-1800 s	USA, WRMI/R Miami Intl	9955am			
1715-1730	Vatican State, Vatican R	4005eu	5883eu	7250eu	9645eu
		11810va			
1730-1755	Austria, R Austria Intl	6155eu	9655me	13710as	13730af
1730-1755	Belgium, R Vlaanderen Int	5910eu	9925eu	11680me	
1730-1800	Georgia, Georgian Radio	6080eu			
1730-1800	Guam, AWR/KSDA	7510as			
1730-1800	Netherlands, Radio	6020af	9605af	11655af	
1730-1800	Philippines, R Pilipinas	11730me	11890me	15190me	
1730-1800	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1730-1745 mtwh	Swaziland, Trans World R	3200af			
1730-1745	UK, BBC African Service	3390af	6070af	9510af	
1730-1800	Vatican State, Vatican R	11625af	13765af		
1745-1800	Bangladesh, Bangla Betar	7190as	9570eu	15520do	
1745-1800	India, All India Radio	6150eu	7410eu	9650af	9910eu
		9950eu	11620eu	11935af	13780af
		15075af			
1745-1800	Swaziland, Trans World R	3200af			
1745-1800	UK, BBC Asian Service	5975as	9510as	9740as	11750as

1800-1900	Anguilla,Caribbean Beacon	11775am			
1800-1900 mtwhf	Argentina, RAE	15345eu			
1800-1900	Australia, Radio	5995pa	6080as	7240pa	9500as
		9590as	9770as	11880pa	
1800-1900 vl	Australia, VL8A Alice Spg	2310do			
1800-1900 vl	Australia, VL8K Katherine	2485do			
1800-1900 vl	Australia, VL8T Tent Crk	2325do			
1800-1900	Bangladesh, Bangla Betar	7190eu	9570as	15520do	
1800-1900	Brazil, Radio Bras	15265eu			
1800-1900	Canada, CFRX Toronto	6070do			
1800-1900	Canada, CFVP Calgary	6030do			
1800-1900	Canada, CHNX Halifax	6130do			
1800-1900	Canada, CKZN St John's	6160do			
1800-1900	Canada, CKZU Vancouver	6160do			
1800-1900	Costa Rica,RF Peace Intl	15050am	21465am		
1800-1827	Czech Rep, Radio Prague	5930eu	9430as		
1800-1830	Egypt, Radio Cairo	15255af			
1800-1900	Eqt Guinea, Radio Africa	15186af			
1800-1900 vl	Georgia, Voice of Hope	6290eu			
1800-1815	Greece, Voice of	7450eu	9420eu	15485na	17705sa
1800-1900	India, All India Radio	7410eu	9650af	9950eu	11620eu
		11935af	13770af	15075af	
1800-1900 vl	Italy, IRRS	3985va			
1800-1900 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1800-1900	Kuwait, Radio	11990na			
1800-1900	Lebanon, Voice of Hope	9960va			
1800-1900	Liberia, Radio Veritas	3435do			
1800-1900 s	Morocco, RTVM Marocaine	17815af			
1800-1830	Netherlands, Radio	6020af	9605af	11655af	
1800-1850 mtwhf	New Zealand, R NZ Intl	9810pa			
1800-1900	North Korea, R Pyongyang	6575eu	9345eu	11700am	13760am
1800-1900 vl	Papua New Guinea, NBC	4890do			
1800-1900	Philippines, R Pilipinas	11730me	11890me	15190me	
1800-1900	Poland, Polish R Warsaw	6000eu	6095eu	7285eu	
1800-1900	Russia,Voice of Russia WS	6130eu	7115af	7175af	7180eu
	7210va 7275af	7305af	7440eu	9890eu	
1800-1830	S Africa, Channel Africa	15240af			
1800-1900	Sudan, Radio Omdurman	9200af			
1800-1900	Swaziland, Trans World R	3200af			
1800-1830	Swaziland, Trans World R	9500af			
1800-1900	UK, BBC African Service	3255af	6005af	6190af	9630af
		15400af	15420af	17830af	
1800-1830	UK, BBC Asian Service	5975as	9510as	9740as	
1800-1815	UK, BBC Asian Service	6065as	7200as	9605as	
1800-1900	UK, BBC World Service	3955eu	6095me	6180eu	6195eu
		9410eu	12095eu	17840na	
1800-1900	USA, KAIJ Dallas TX	13815am			
1800-1859	USA, KHBI N Mariana Is	9355eu	9385af		
1800-1900	USA, KJES Mesquite NM	15385au			
1800-1900	USA, KTBN Salt Lk City UT	15590am			
1800-1900	USA, KWHR Naalehu HI	7560pa	13625as		
1800-1900	USA, Voice of America	6035af	6040af	9760eu	11920af
		11975af	13710af	15410af	15580af
1800-1900	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1800-1900	USA, WGTG McCaysville GA	9400am			
1800-1900	USA, WHRI Noblesville IN	9495am	13760eu		
1800-1900	USA, WINB Red Lion PA	13790af			
1800-1900	USA, WJCR Upton KY	7490na			
1800-1900	USA, WMLK Bethel PA	9465am			
1800-1900	USA, WRMI/R Miami Intl	9955am			
1800-1900	USA, WRNO New Orleans LA	15420am			
1800-1859 s	USA, WSHB Cypress Crk SC	13770eu			
1800-1859 sw	USA, WSHB Cypress Crk SC	18930af			
1800-1900	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1800-1900	USA, WYFR Okeechobee FL	15695sk	17555eu		
1800-1825	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
1800-1900	Yemen, Radio Aden	9780do			
1800-1900	Zambia, Christian Voice	3330af	4965af		
1800-1900 vl	Zambia, R Zambia/ZNBC 1	4910do			
1800-1900 vl	Zambia, R Zambia/ZNBC 2	6165do			
1800-1900 vl	Zimbabwe, Zimbabwe BC	4828do			
1805-1830	Malawi, MBC	5993do			
1830-1855	Belgium, R Vlaanderen Int	9925af	13745af		
1830-1900 vl	Cyprus, BRT International	6150do			
1830-1900	Georgia, Georgian Radio	6230eu			
1830-1900	Netherlands, Radio	6020af	9605af	9895af	11655af
		15315af			
1830-1900 w	Saipan, FEBC/KFBS	9465as			
1830-1835	Somalia, Radio Mogadishu	6732do			
1830-1900 mtwfha	Sweden, Radio	6065eu			
1830-1900 s	Sweden, Radio	9645eu			
1830-1900	UK, BBC Asian Service	9740pa			
1830-1845 m w	UK, BBC World Service	6050eu	7325eu	9685eu	
1830-1900 as	USA, Voice of America	7150af	9845af	15445af	
1840-1850	Greece, Voice of	11645af	15150af		
1845-1900 irreg s	Mali, RDTV Malienne	4783do	4835do	5995do	
1850-1900 smtwhf	New Zealand, R NZ Intl	11735pa			

FREQUENCIES

1900-2000	Anguilla,Caribbean Beacon	11775am			
1900-2000	Australia, Radio	5995pa	6080pa	7240pa	9500as
		9590as	9770pa	11880pa	
1900-2000 vl	Australia, VL8A Alice Spg	2310do			
1900-2000 vl	Australia, VL8K Katherine	2485do			
1900-2000 vl	Australia, VL8T Tent Crk	2325do			
1900-1920	Brazil, Radio Bras	15265eu			
1900-2000	Canada, CFRX Toronto	6070do			
1900-2000	Canada, CFVP Calgary	6030do			
1900-2000	Canada, CHNX Halifax	6130do			
1900-2000	Canada, CKZN St John's	6160do			
1900-2000	Canada, CKZU Vancouver	6160do			
1900-2000	China, China Radio Intl	6955af	9440af	9600af	9870af
1900-2000	Costa Rica,RF Peace Intl	15050am	21465am		
1900-2000	Ecuador, HCJB	12015am	21455am		
1900-2000	Eqt Guinea, Radio Africa	15186af			
1900-2000 vl	Georgia, Voice of Hope	6290eu			
1900-1950	Germany, Deutsche Welle	9640af	9765af	11785af	11810af
		13690af	15135af	15425af	
1900-1910	Greece, Voice of	7480eu	9380eu		
1900-2000	Guatemala, Adv World R	5980am			
1900-1945	India, All India Radio	7410eu	9650af	9950eu	11620eu
		11935af	13780af	15075as	
1900-2000 vl	Italy, IRRS	3985va			
1900-2000 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
1900-2000	Kuwait, Radio	11990eu			
1900-2000	Lebanon, Voice of Hope	9960va			
1900-2000	Liberia, Radio Veritas	3425do			
1900-1915	Liberia,LCN/R Liberia Int	5100do			
1900-2000	Netherlands, Radio	6020af	9605af	9895af	11655af
		15315af			
1900-1950	New Zealand, R NZ Intl	11735pa			
1900-2000	Nigeria, Voice of	7255af			
1900-2000	North Korea, R Pyongyang	4405af	6520af	9600af	9975af
1900-1930 s	Norway, Radio Norway Intl	7485eu	9590af	9960na	
1900-2000 vl	Papua New Guinea, NBC	4890do			
1900-1930	Philippines, R Pilipinas	11730me	11890me	15190me	
1900-2000	Russia,Voice of Russia WS	4920eu	5940eu	5965eu	6130eu
	7180eu 7210af	7255af	7275af	7305af	7325af
	7440eu 7490af	9440af	9505af	9585af	9890eu
1900-2000 vl	Solomon Islands, SIBC	5020do			
1900-2000	South Korea, R Korea Intl	5975as	7275as		
1900-2000 a	Sri Lanka, Sri Lanka BC	5975eu			
1900-2000	Swaziland, Trans World R	3200af			
1900-1930 s	Sweden, Radio	9645eu			
1900-2000	Thailand, Radio	9535eu	9655eu	11905eu	
1900-2000	UK, BBC African Service	3255af	6005af	6190af	9630af
	11835af 11880af	15105af	15400af	17830af	17885af
1900-2000	UK, BBC Asian Service	9740pa			
1900-2000 s	UK, BBC Asian Service	5975me			
1900-2000	Uk, BBC World Service	3955eu	6180eu	6195eu	9410eu
		12095eu			
1900-2000	UK, BBC World Service	5975me	6150eu	7210eu	
1900-2000	USA, KAIJ Dallas TX	13815am			
1900-1959	USA, KHBI N Mariana Is	9355eu	9385af		
1900-2000	USA, KJES Mesquite NM	15385am			
1900-2000	USA, KTBN Salt Lk City UT	15590am			
1900-2000	USA, KWHR Naalehu HI	7560pa	13625as	17555pa	
1900-2000	USA, Voice of America	6035af	9525pa	9760eu	11870pa
	11920af 11975af	13710af	15180pa	15410af	15580af
1900-1930 s	USA, Voice of America	4950af			
1900-2000	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
1900-2000	USA, WGTG McCaysville GA	9400am			
1900-2000	USA, WHRI Noblesville IN	9495am	13760eu		
1900-2000	USA, WINB Red Lion PA	13790af			
1900-2000	USA, WJCR Upton KY	7490na			
1900-1930 s	USA, WRMI/R Miami Intl	9955am			
1900-2000	USA, WRNO New Orleans LA	15420am			
1900-1959 sth	USA, WSHB Cypress Crk SC	13770eu			
1900-2000	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
1900-2000	USA, WYFR Okeechobee FL	17555pa			
1900-1925	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu			
1900-2000	Zambia, Christian Voice	3330af	4965af		
1900-2000 vl	Zambia, R Zambia/ZNBC 1	4910do			
1900-2000 vl	Zambia, R Zambia/ZNBC 2	6165do			
1900-2000 vl	Zimbabwe, Zimbabwe BC	4828do			
1925-2000 vl	Cyprus, BRT International	6150do			
1930-2000 t	Belarus, Radiosta Belarus	6010eu	7105eu	7205eu	7210eu
1930-2000	Georgia, Georgian Radio	6230eu			
1930-2000	Iran, VOIRI	7160eu	7260eu	9022eu	
1930-2000	Mongolia, Voice of	9720eu	12085eu		
1930-2000 a	Serbia, Radio Yugoslavia	6100eu	9720af		
1930-2000	Slovakia, R Slovakia Intl	5915eu	6055eu	7345eu	
1930-2000	Turkey, Voice of	5960eu	6175na		
1930-2000	USA, Voice of America	4950af			
1935-1955	Italy, RAI Intl	6015eu	7225eu		
1945-2000	Albania, R Tirana Intl	6025eu	7135eu		
1945-2000 t	Germany, Universal Life	5890eu			
1950-2000 smtwhf	New Zealand, R NZ Intl	15115pa			
1950-2000 a	New Zealand, R NZ Intl	11735pa			
1956-2000	S Africa, Voice of Hope	6290af			

2000-2100	Algeria, R Algiers Intl	15160af			
2000-2100	Angola, Radio Nacional	3355do	9535do		
2000-2100	Anguilla,Caribbean Beacon	11775am			
2000-2100	Australia, Radio	5995pa	9500as	9590as	9770as
		11880pa			
2000-2100 vl	Australia, VL8A Alice Spg	2310do			
2000-2100 vl	Australia, VL8K Katherine	2485do			
2000-2100 vl	Australia, VL8T Tent Crk	2325do			
2000-2100	Bulgaria, Radio	7530eu	9700eu		
2000-2100	Canada, CFRX Toronto	6070do			
2000-2100	Canada, CFVP Calgary	6030do			
2000-2100	Canada, CHNX Halifax	6130do			
2000-2100	Canada, CKZN St John's	6160do			
2000-2100	Canada, CKZU Vancouver	6160do			
2000-2100	China, China Radio Intl	5220af	6950eu	7160af	7170af
	7175af 9440af	9600va	9535af	9920eu	
2000-2100	Costa Rica,RF Peace Intl	15050am	21465am		
2000-2100 vl	Cyprus, BRT International	6150do			
2000-2100	Ecuador, HCJB	12015eu	21455am		
2000-2100	Eqt Guinea, Radio Africa	15186af			
2000-2030 m	Estonia, Radio Tallinn	5925eu			
2000-2100 vl	Georgia, Voice of Hope	6290eu			
2000-2050	Germany, Deutsche Welle	7285eu			
2000-2015 t	Germany, Universal Life	5890eu			
2000-2030	Ghana, Ghana Broadc Corp	3366do	4915do		
2000-2100	Guatemala, Adv World R	5980am			
2000-2030	Hungary, Radio Budapest	3975eu	9535eu	9835eu	
2000-2100	Indonesia, Voice of	15150as			
2000-2030	Iran, VOIRI	7160eu	7260eu	9022eu	
2000-2025	Israel, Kol Israel	7465na	9365na	9435eu	15640au
2000-2100 vl	Italy, IRRS	3985va			
2000-2100 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2000-2100	Kuwait, Radio	11990eu			
2000-2030 a	Latvia, Radio	5935eu			
2000-2100	Lebanon, Voice of Hope	9960va			
2000-2100	Liberia, Radio Veritas	3425do			
2000-2100 smtwha	Malta, VO Mediterranean	7440eu			
2000-2030	Mexico, Radio Mexico Intl	9705na			
2000-2025	Netherlands, Radio	6020af	9605af	9895af	11655af
		15315af			
2000-2100	New Zealand, R NZ Intl	15115pa			
2000-2005	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2000-2030 s	Norway, Radio Norway Intl	7570au			
2000-2100 vl	Papua New Guinea, NBC	4890do			
2000-2100	Russia,Voice of Russia WS	4920eu	5940eu	5965eu	6130eu
	7180eu 7305af	7325af	7440eu	7490af	9440af
	9585af 9820eu	9890eu			
2000-2005	S Africa, Voice of Hope	6290af			
2000-2015	Sierra Leone, SLBS	3316do			
2000-2100 vl	Solomon Islands, SIBC	5020do			
2000-2015 irreg	Somalia, Radio Mogadishu	6870af			
2000-2100 mtwhf	Spain, R Exterior Espana	6125eu	11775af		
2000-2015	Swaziland, Trans World R	3200af			
2000-2030	Switzerland, Swiss R Intl	6165eu	7410eu	9620af	9885af
		9905af	11725af		
2000-2030	Turkey, Voice of	5960eu	6175na		
2000-2015	Uganda, Radio	4976do			
2000-2100	UK, BBC African Service	3255af	6005af	6190af	9630af
		11835af	15400af	17830af	
2000-2100	UK, BBC Asian Service	5975pa	9740pa		
2000-2100	UK, BBC World Service	3955eu	6180eu	6195eu	7325eu
		9410eu	11750sa	12095eu	
2000-2100	USA, KAIJ Dallas TX	13815am			
2000-2100	USA, KTBN Salt Lk City UT	15590am			
2000-2100	USA, KWHR Naalehu HI	7560pa	13625pa	17555pa	
2000-2100	USA, Voice of America	6035af	7415af	9760eu	11855af
		11975af	13710af	15205as	15410af
		15445af	15580af	17725af	17755af
2000-2030	USA, Voice of America	4950af			
2000-2100	USA, WEWN Birmingham AL	11875na	13615am	17695eu	
2000-2100	USA, WGTG McCaysville GA	9400am			
2000-2100	USA, WHRI Noblesville IN	9495am	13760eu		
2000-2100	USA, WINB Red Lion PA	13790eu			
2000-2100	USA, WJCR Upton KY	7490na			
2000-2100	USA, WRNO New Orleans LA	15420am			
2000-2059 s	USA, WSHB Cypress Crk SC	9355eu			
2000-2100	USA, WWCR Nashville TN	9475am	12160am	13845am	15685am
2000-2100	USA, WYFR Okeechobee FL	5810eu	7355af	15565eu	21525af
2000-2010	Vatican State, Vatican R	7365af	9660af	11625af	
2000-2100	Zambia, Christian Voice	3330af	4965af		
2000-2100 vl	Zambia, R Zambia/ZNBC 2	6165do			
2000-2100 vl	Zimbabwe, Zimbabwe BC	4828do			
2005-2100	Syria, Radio Damascus	9950eu	12085eu	13610eu	
2015-2030	Namibia, NBC	3270do	3290do		
2025-2045	Italy, RAI Intl	7125eu	9685af	11840as	
2030-2100	Cuba, Radio Havana	13605eu	13615eu	13715eu	
2030-2100	Egypt, Radio Cairo	15375af			
2030-2130	Finland, YLE/R Finland	9875af			
2030-2100	Germany,Adventist World R	9835af			
2030-2100	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2030-2100	Slovakia, AWR Europe	7265af			
2030-2100	Sweden, Radio	6065eu			
2030-2045	Thailand, Radio	9535eu	9655eu	11905eu	
2030-2100 as	USA, Voice of America	4950af			
2030-2100	Uzbekistan, R Tashkent	7105me	9540as		
2030-2055	Vietnam, Voice of	5940eu	7270eu	7400eu	9840eu
		12020eu			
2045-2100	India, All India Radio	7150au	7410eu	9650eu	9910au
		9950eu	11620eu	11715au	
2050-2100	Vatican State, Vatican R	4005eu	5883eu	7250eu	9645eu
2057-2100	Iraq, Radio Iraq Intl	11785me			

FREQUENCIES

2100-2200	Anguilla,Caribbean Beacon	11775am			
2100-2130	Australia, Radio	5995pa	7240pa	9500as	9660pa
		9770as	11880pa	12080pa	17795pa
2100-2130 vl	Australia, VL8A Alice Spg	2310do			
2100-2130 vl	Australia, VL8K Katherine	2485do			
2100-2200 vl	Australia, VL8K Katherine	5025do			
2100-2130 vl	Australia, VL8T Tent Crk	2325do			
2100-2200 vl	Australia, VL8T Tent Crk	4910do			
2100-2115 vl	Cameroon, Radio Cameroon	4850do			
2100-2200 vl	Cameroon, Radio Garoua	5010do			
2100-2200 vl	Canada, CBC N Quebec Svc	9625do			
2100-2200	Canada, CFRX Toronto	6070do			
2100-2200	Canada, CFVP Calgary	6030do			
2100-2200	Canada, CHNX Halifax	6130do			
2100-2200	Canada, CKZN St John's	6160do			
2100-2200	Canada, CKZU Vancouver	6160do			
2100-2200	Canada, R Canada Intl	5925va	5995va	7235va	9805va
	11945va 13650va	13690va	15150va	17820af	
2100-2130	China, China Radio Intl	5220va	6950eu	7170af	7180af
		9535af	9670va	9920eu	
2100-2200	China, China Radio Intl	6950eu	9635eu	9920eu	
2100-2200	Costa Rica,RF Peace Intl	15050am	21465am		
2100-2130	Cuba, Radio Havana	13605eu	13615eu	13715eu	
2100-2200 vl	Cyprus, BRT International	6150do			
2100-2127	Czech Rep, Radio Prague	5930na	7345af		
2100-2200	Ecuador, HCJB	12015eu	21455am		
2100-2200	Egypt, Radio Cairo	15375af			
2100-2200	Eqt Guinea, Radio Africa	15186af			
2100-2130	Finland, YLE/R Finland	6135eu			
2100-2200 vl	Georgia, Voice of Hope	6290eu			
2100-2150	Germany, Deutsche Welle	9615af	9670as	9690af	9765as
		11785as	11865af	15275af	
2100-2130	Germany,Adventist World R	9835af			
2100-2200	India, All India Radio	7150va	7410eu	9650eu	9910au
		9950eu	11620eu	11715au	
2100-2157	Iraq, Radio Iraq Intl	11785me			
2100-2200 vl	Italy, IRRS	3955va			
2100-2130	Japan, R Japan/NHK World	6090as			
2100-2200	Japan, R Japan/NHK World	6035as	13630na		
2100-2107 vl	Kenya, Kenya Broadc Corp	4885do	4935do	6150do	
2100-2200	Lebanon, Voice of Hope	9960va			
2100-2200	Liberia, Radio Veritas	3425do			
2100-2115	Liberia,LCN/R Liberia Int	5100do			
2100-2130	Mexico, Radio Mexico Intl	9705na			
2100-2107	Namibia, NBC	3270do	3290do		
2100-2155	New Zealand, R NZ Intl	15115pa			
2100-2200	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2100-2200	North Korea, R Pyongyang	6575eu	9345eu	11700am	13760am
2100-2200 vl	Papua New Guinea, NBC	4890do			
2100-2129	Poland, Polish R Warsaw	6035eu	6095eu	7285eu	
2100-2130 mtwhf	Portugal, R Portugal Intl	7110eu	9780eu	9815eu	
2100-2156	Romania, R Romania Intl	5955eu	5990eu	6175eu	7195eu
2100-2200	Russia,Voice of Russia WS	5940eu	5965eu	7170eu	7180eu
	7205af 7320eu	7440eu	9695af	9890eu	
2100-2130	Slovakia, AWR Europe	7265af			
2100-2200 vl	Solomon Islands, SIBC	5020do			
2100-2130	South Korea, r Korea Intl	6480eu			
2100-2200	South Korea, R Korea Intl	15575eu			
2100-2130	Switzerland, Swiss R Intl	6165eu	7410eu		
2100-2200	Syria, Radio Damascus	9950na	12085na	13610na	
2100-2110	Uganda, Radio	4976do			
2100-2200	UK, BBC African Service	6005af	6190af	11835af	
2100-2200	UK, BBC Asian Service	3915as	5965as	5975pa	6120as
		6195as	9740pa		
2100-2200	UK, BBC World Service	3955eu	5975am	6180eu	6195eu
		7325eu	9410eu	11750sa	
2100-2200	USA, KAIJ Dallas TX	13815am			
2100-2200	USA, KTBN Salt Lk City UT	15590am			
2100-2200	USA, KWHR Naalehu HI	7560pa	17555pa		
2100-2200	USA, Voice of America	6035af	6070me	7415af	9595af
	9760eu 11870pa	11975af	13710af	15185as	15205as
	15410af 15580af	17725af	17735as		
2100-2200	USA, WEWN Birmingham AL	11875na	13615na	17695eu	
2100-2200	USA, WGTG McCaysville GA	9400am			
2100-2200	USA, WHRI Noblesville IN	9495am	13760am		
2100-2200	USA, WINB Red Lion PA	13790eu			
2100-2200	USA, WJCR Upton KY	7490na			
2100-2130 s	USA, WRMI/R Miami Intl	9955am			
2100-2200	USA, WRNO New Orleans LA	15420am			
2100-2159 s	USA, WSHB Cypress Crk SC	9355eu			
2100-2159 smwa	USA, WSHB Cypress Crk SC	7510eu			
2100-2200	USA, WWCR Nashville TN	7435am	9475am	12160am	13845am
		15685am			
2100-2200	USA, WYFR Okeechobee FL	7355eu	11580af	15565eu	
2100-2110	Vatican State, Vatican R	4005eu	5883eu	7250eu	
2100-2200	Zambia, Christian Voice	3330af	4965af		
2100-2200 vl	Zambia, R Zambia/ZNBC 1	4910do			
2100-2200 vl	Zambia, R Zambia/ZNBC 2	6165do			
2100-2200 vl	Zimbabwe, Zimbabwe BC	4828do			
2115-2145 mtwhfa	Armenia, Voice of	4810eu	9965eu		
2115-2200	Egypt, Radio Cairo	9900eu			
2115-2130 mtwhf	UK, BBC Caribbean Report	5975ca	15390ca	17715ca	
2115-2130 as	UK, BBC World Service	5975am			
2130-2200	Australia, Radio	7240pa	9660pa	11695as	12080pa
		13755pa	17795pa		
2130-2200	China, China Radio Intl	5220va	6950eu	9670va	9920eu
2130-2200	Ghana, Ghana Broadc Corp	3366do			
2130-2200	Guam, AWR/KSDA	9495as			
2130-2200	Iran, VOIRI	6165pa	6175pa		
2130-2135 mtwhf	Latvia, Radio	5935eu			
2130-2200	Malawi, MBC	3380do			
2130-2200 as	Sweden, Radio	6065eu	9655eu		
2130-2200	Turkey, Voice of	7200eu			
2130-2145 t f	UK, BBC Calling Falklands	11680sa			
2130-2200	UK, BBC World Service	5875eu	6050eu	9850eu	
2130-2200	Uzbekistan, R Tashkent	7105as	9540as		
2155-2200 smtwh	New Zealand, R NZ Intl	17675pa			
2155-2200	New Zealand, R NZ Intl	15115pa			

2200 UTC

2200-2230	Albania, R Tirana Intl	6025eu	7135eu		
2200-2300	Anguilla,Caribbean Beacon	6090am			
2200-2215 mtwhfa	Armenia, Voice of	4810eu	9965eu		
2200-2300	Australia, Radio	9660pa	11695as	13755pa	15510as
		17795pa			
2200-2300 vl	Australia, VL8K Katherine	5025do			
2200-2300 vl	Australia, VL8T Tent Crk	4910do			
2200-2300	Bulgaria, Radio	7530eu	9700eu		
2200-2300	Canada, CBC N Quebec Svc	9625do			
2200-2300	Canada, CFRX Toronto	6070do			
2200-2300	Canada, CFVP Calgary	6030do			
2200-2300	Canada, CHNX Halifax	6130do			
2200-2300	Canada, CKZN St John's	6160do			
2200-2300	Canada, CKZU Vancouver	6160do			
2200-2229	Canada, R Canada Intl	5995va	7235va	9735va	9805va
		11705as	11945va	13690va	15150va
2200-2230	China, China Radio Intl	3985eu	7170eu		
2200-2300	Costa Rica,RF Peace Intl	7385am	15050am	21465am	
2200-2300 vl	Cyprus, BRT International	6150do			
2200-2245	Egypt, Radio Cairo	9900eu			
2200-2300	Eqt Guinea, Radio Africa	15186af			
2200-2215	Ghana, Ghana Broadc Corp	4915do			
2200-2230	Hungary, Radio Budapest	3975eu	9840eu		
2200-2230	India, All India Radio	7150va	7410eu	9650eu	9910au
		9950eu	11620eu	11715au	
2200-2230	Iran, VOIRI	6165pa	6175pa		
2200-2225	Italy, RAI Intl	6150pa	9675pa	11900as	
2200-2300	Lebanon, Voice of Hope	9960va			
2200-2215	Liberia,LCN/R Liberia Int	5100do			
2200-2300	Malaysia, Radio	7295do			
2200-2225	Moldova, R Moldova Intl	7520eu			
2200-2205 smtwh	New Zealand, R NZ Intl	17675pa			
2200-2205 fa	New Zealand, R NZ Intl	15115pa			
2200-2215	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2200-2230 s	Norway, Radio Norway Intl	7570sa			
2200-2300 vl	Papua New Guinea, NBC	9675do			
2200-2230	Serbia, Radio Yugoslavia	6100eu	6185eu		
2200-2215	Sierra Leone, SLBS	3316do			
2200-2230	Slovakia, AWR Europe	6055eu			
2200-2300 vl	Solomon Islands, SIBC	5020do			
2200-2230	South Korea, R Korea Intl	3970eu			
2200-2300	Spain, R Exterior Espana	6125eu	11775af		
2200-2210	Syria, Radio Damascus	9950eu	12085na	13610na	
2200-2300	Taiwan, Taipei Radio Intl	5810eu	9985eu		
2200-2230	Turkey, Voice of	7200eu			
2200-2300	UK, BBC African Service	11835af			
2200-2300	UK, BBC Asian Service	5905as	5965as	6195as	7110as
		11955as			
2200-2300	UK, BBC World Service	3955eu	5975am	6110am	6175na
	7325eu 9410eu	9560am	9590na	9660as	9825am
	9915sa 11750sa	11765am	12080pa	15390am	
2200-2300	Ukraine, R Ukraine Intl	5905eu	5940eu	6010eu	6020eu
		6080eu	7205eu	7420eu	
2200-2300	USA, KAIJ Dallas TX	13815am			
2200-2300	USA, KTBN Salt Lk City UT	15590am			
2200-2300	USA, KWHR Naalehu HI	7560pa	17555pa		
2200-2300	USA, Voice of America	7215as	9770as	9890as	11760as
	15185as 15290as	15305as	17735as	17820as	
2200-2230 mtwhf	USA, Voice of America	6035af	7415af	11975af	12080af
		13710af			
2200-2300	USA, WEWN Birmingham AL	5825eu	13615na		
2200-2300	USA, WGTG McCaysville GA	9400am			
2200-2300	USA, WHRI Noblesville IN	5745am	9495am		
2200-2300	USA, WINB Red Lion PA	11950ca			
2200-2300	USA, WJCR Upton KY	7490na			
2200-2300 a	USA, WRMI/R Miami Intl	9955am			
2200-2300	USA, WRNO New Orleans LA	15420am			
2200-2259 sh	USA, WSHB Cypress Crk SC	7510eu			
2200-2259 sw	USA, WSHB Cypress Crk SC	13770sa			
2200-2300	USA, WWCR Nashville TN	5070am	7435am	9475am	13845am
2200-2300	USA, WYFR Okeechobee FL	11580af	11855ca	15565eu	
2200-2300 vl	Zambia, R Zambia/ZNBC 1	4910do			
2203-2210	Croatia, Croatian Radio	9590as			
2205-2300	New Zealand, R NZ Intl	17675pa			
2230-2255	Austria, R Austria Intl	5945eu	6155eu	13730af	
2230-2300	China, China Radio Intl	7170eu			
2230-2300	Cuba, Radio Havana	6000na			
2230-2227	Czech Rep, Radio Prague	5930na	7345na		
2230-2300	Iraq, Radio Iraq Intl	11785me			
2230-2300	Sweden, Radio	6065eu	7325eu		
2240-2250	Greece, Voice of	9420au	11645au		
2245-2300	Ghana, Ghana Broadc Corp	3366do	4915do		
2245-2300	India, All India Radio	7410as	9705as	9950as	11620as
2245-2300 mtwhf	USA, WRMI/R Miami Intl	9955am			
2245-2300	Vatican State, Vatican R	6160au	7305au	9600au	11830au
		11830au			

Frequencies

2300-0000	Anguilla,Caribbean Beacon	6090am			
2300-0000	Australia, Radio	9660pa	12080pa	13755pa	15510pa
		17795pa			
2300-0000 vl	Australia, VL8K Katherine	5025do			
2300-0000 vl	Australia, VL8T Tent Crk	4910do			
2300-0000	Canada, CBC N Quebec Svc	9625do			
2300-0000	Canada, CFRX Toronto	6070do			
2300-0000	Canada, CFVP Calgary	6030do			
2300-0000	Canada, CHNX Halifax	6130do			
2300-0000	Canada, CKZN St John's	6160do			
2300-0000	Canada, CKZU Vancouver	6160do			
2300-2330	Canada, R Canada Intl	5960am	6040ca	9535ca	9755am
		11865ca			
2300-0000	Costa Rica, Adv World R	5030am	6150am	9725am	13750am
		15460am			
2300-0000	Costa Rica,RF Peace Intl	7385am	15050am	21465am	
2300-2330	Cuba, Radio Havana	6000na			
2300-0000	Egypt, Radio Cairo	9900na			
2300-2350	Germany, Deutsche Welle	6045as	6130as	7235as	
2300-2330	Guam, AWR/KSDA	11775as			
2300-0000	Guatemala, Adv World R	11775am			
2300-0000	India, All India Radio	7410as	9705as	9950as	11620as
2300-0000	Lebanon, Voice of Hope	9960va			
2300-2315	Liberia,LCN/R Liberia Int	5100do			
2300-0000	Malaysia, Radio	7295do			
2300-2325	Moldova, R Moldova Intl	7520eu			
2300-0000	New Zealand, R NZ Intl	17675pa			
2300-2315	Nigeria, FRCN/Radio	3326do	4770do	4990do	
2300-2357	North Korea, R Pyongyang	3560na	4405na	11335na	11700na
		13760na	15130na		
2300-0000 vl	Papua New Guinea, NBC	9675do			
2300-2356	Romania, R Romania Intl	5955eu	7195eu	9570na	11830na
2300-0000	Singapore, SBC Radio One	6160do			
2300-0000 vl	Solomon Islands, SIBC	5020do			
2300-0000	Turkey, Voice of	6135eu	9655eu		
2300-0000	UK, BBC Asian Service	3915as	5965as	6035as	6195as
		7110as	9580as	11945as	11955as
2300-0000	UK, BBC World Service	3955eu	5875am	5975am	6110am
		6175na	6195eu	9590na	9825am
		9915sa	11750sa	11765am	
2300-0000	USA, KAIJ Dallas TX	13815am			
2300-0000	USA, KTBN Salt Lk City UT	15590am			
2300-0000	USA, KWHR Naalehu HI	7560pa	17555pa		
2300-0000	USA, Voice of America	7215as	9770as	9890as	11760as
		15185as	15290as	15305as	17735as
		17820as			
2300-0000	USA, WEWN Birmingham AL	5825eu	13615na		
2300-0000	USA, WGTG McCaysville GA	9400am			
2300-0000	USA, WHRI Noblesville IN	5745am	9495am		
2300-0000	USA, WINB Red Lion PA	11950ca			
2300-0000	USA, WJCR Upton KY	7490na			
2300-0000 a	USA, WRMI/R Miami Intl	9955am			
2300-0000	USA, WRNO New Orleans LA	7355na			
2300-2359 sw	USA, WSHB Cypress Crk SC	7510eu			
2300-2359 sm	USA, WSHB Cypress Crk SC	13770am			
2300-0000	USA, WWCR Nashville TN	5070am	7435am	9475am	13845am
2300-2315	Vatican State, Vatican R	7305au	9600au	11830au	
2310-2315	Kyrgstan, Kyrgyz Radio	4010do	4050do		
2330-0000 as	Canada, R Canada Intl	6040am	9535am	11865am	
2330-0000 vl	Ghana, Ghana Broadc Corp	4915af			
2330-0000 mtwhf	Guam, AWR/KSDA	11775as			
2330-0000	Netherlands, Radio	6020na	6165na		
2330-2355	Vietnam, Voice of	5940af	7270af	7400af	9840af
		12020af			
2335-2345	Greece, Voice of	9395sa	9425sa	11595sa	11710sa
2335-2345	Sierra Leone, SLBS	3316do			
2345-0000 mtwhf	UK, BBC Asian Service	3915as			
2355-0000	Cambodia, Natl Voice of	11940as			

Selected Programs

Sundays

2300 Herald Broadcasting (WSHB #1&2): Sunday Service from the Mother Church. From the First Church of Christ, Scientist, in Boston, MA, USA.
2300 USA, VOA Washington DC (as): VOA News. Ten minutes of worldwide news on the hour.
2300 Vatican State, Vatican Radio: Saints Alive. A short biography of the life of a saint.
2310 USA, VOA Washington DC (as): VOA Today. Up-to-the-minute news summaries, hourly business and sports updates, interviews on world news events, plus features on topics from movies to medicine.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2339 Netherlands, Radio: Wide Angle. See S 1238.
2354 Netherlands, Radio: Siren Song. See S 1254.

Mondays

2300 Herald Broadcasting (WSHB #2): Bible Lesson. See S 0000.
2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2300 Vatican State, Vatican Radio: Ask the Abbot. The abbot answers questions about the Catholic faith.
2310 USA, VOA Washington DC (as): VOA Worldwide. A daily morning program that provides in-depth analysis of global issues and events through daily roundtable discussions.
2328 Herald Broadcasting (WSHB #2): The Christian Science Sentinel. See S 0028.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2338 Netherlands, Radio: Newsline. See S 0038.
2353 Netherlands, Radio: A Good Life. See M 1253.

Tuesdays

2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2300 Vatican State, Vatican Radio: What Can I Do?. A practical guide for the practicing Catholic.
2310 USA, VOA Washington DC (as): VOA Worldwide. See As/Oce/Pac 2310.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2338 Netherlands, Radio: Newsline. See S 0038.
2353 Netherlands, Radio: Music 52-15. See T 1253.

Wednesdays

2300 Herald Broadcasting (WSHB #1): Bible Lesson. See S 0000.
2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2300 Vatican State, Vatican Radio: Would You Believe It?. Some background about the precepts of the Catholic Church.
2310 USA, VOA Washington DC (as): VOA Worldwide. See As/Oce/Pac 2310.
2328 Herald Broadcasting (WSHB #1): The Christian Science Sentinel. See S 0028.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2338 Netherlands, Radio: Newsline. See S 0038.
2353 Netherlands, Radio: Sounds Interesting. See S 1153.

Thursdays

2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2300 Vatican State, Vatican Radio: Ask the Abbot. See M 2300.
2310 USA, VOA Washington DC (as): VOA Worldwide. See As/Oce/Pac 2310.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2338 Netherlands, Radio: Newsline. See S 0038.
2353 Netherlands, Radio: Research File. See M 1153.

Fridays

2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2301 Vatican State, Vatican Radio: What Can I Do?. See T 2300.
2310 USA, VOA Washington DC (as): VOA Worldwide. See As/Oce/Pac 2310.
2330 Netherlands, Radio: News. See S 0030.
2330 UK, BBC London (AF): Just a Taste (6th,13th,20th). See T 0145.
2335 Greece, Voice of: News. See S 0130.
2338 Netherlands, Radio: Newsline. See S 0038.
2354 Radio Netherlands: Documentary. Belgium (27th). Jonathan Groubert examines the history of this three-headed society.
2354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (20th). See H 1454.
2354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (Batavia: Queen of the High Seas) (6th). See W 1154.
2354 Radio Netherlands: Documentary. The Dutch Seaborne Empire (The Beginning of the End) (13th). See A 0154.

Saturdays

2300 USA, VOA Washington DC (as): VOA News. See As/Oce/Pac 2300.
2300 Vatican State, Vatican Radio: On-the-Air. See S 0608.
2310 USA, VOA Washington DC (as): VOA Sunday. Interviews and features about science, sports, agriculture, and business, plus the latest American music.
2330 Netherlands, Radio: News. See S 0030.
2335 Greece, Voice of: News. See S 0130.
2339 Netherlands, Radio: Newsline. See S 0038.
2354 Netherlands, Radio: Roughly Speaking. See S 0153.

NVIS Propagation in North America (Conclusion)

By Jacques d'Avignon
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If you lived anywhere along the railway in isolated areas of Canada, chances are, if you tuned your radio to the broadcast band, there was a high quality signal of the network programs available so long as there was power available at the railway station! The propagation mode in these cases was, and still is, vertical incidence skywave. The frequencies in the broadcast band are below the frequencies that will penetrate the ionosphere. (See *MT* July and August 1997 for an explanation of the NVIS propagation mode used in tropical broadcasting.)

In 1941, the first low power broadcast frequency relays were installed in the interior valleys of British Columbia that could not be properly served by regular CBC broadcast transmitters. By 1980 there were over 450 such low-power transmitters across Canada!

The callsigns of these repeaters were often the same as the originating station plus a numerical suffix, such as CBF-4. This additional callsign would be announced during the regular originating station break. It made for some interesting station breaks when the originating station was being repeated by as many as 10 low power repeaters scattered over large areas; the station break would contain all the callsigns. You never knew exactly which repeater you were listening to without looking at the frequency on your dial and checking a frequency list.

Even if these transmitters were very low power in comparison with the regular broadcast transmitters, the signal was reaching far places. It was not unusual to hear a northern Ontario transmitter at your Toronto location, or a far eastern Quebec relay in Montreal. The low power repeater transmitters were conservatively rated at 20 or 40W, but could produce more if you pushed the final 6L6's to the limit of their capability. (For those "youngsters" who do not know what a 6L6 is, it is a vacuum tube often used in the final stage of an RF amplifier and, in some cases, still today, in the final amplification stage of high-priced audio amplifiers.)

In the fall of 1952, the 50 kW transmitter of the French network station in Montreal, CBF 690 kHz, was destroyed by fire. Radio Canada engineers installed one of the spare low power repeaters in the main control room of the network in downtown Montreal, fed a vertical wire 10 stories high installed in the courtyard behind the building, and were able to cover the metropolitan area of the city for two days! The signal was not strong, but service was maintained.

A few AM low-power repeaters are still operational in Canada, but many have been replaced by strategically located high-power FM repeaters. With the present trend for the Canadian broadcast stations to migrate to the FM band, it is only a matter of time for most of these repeaters to cease operations and to be replaced by high power FM repeaters. But there will always be some areas where these AM repeaters will be needed. With the metallic telegraph lines along the railways being abandoned, it is quite possible that some repeaters are now being fed the network audio by satellite! But NVIS lives on, even in North America!

Only a few months are left for good DX; enjoy them and start planning for next DX season. Remember, the solar activity is increasing, thus making DX better each year.

OPTIMUM WORKING FREQUENCIES (MHz)

For the Period 15 March to 14 April 1998 Flux=110 SSN=62

Predictions prepared using ASAPS for Windows®

UTC	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
TO/FROM US WEST COAST																								
SOUTH AMERICA	23	22	19	16	14	13	13	13	13	11	9	11	11	13	18	21	22	22	23	24	25	25	25	24
WESTERN EUROPE	10	9	9	9	8	8	9	9	9	9	*	*	*	*	13	15	16	17	17	16	16	15	13	11
EASTERN EUROPE (P)	*	*	9	9	11	12	11	*	*	*	*	*	*	*	12	15	16	16	15	13	*	*	*	*
MEDITERRANEAN	13	13	14	13	13	12	11	*	*	*	*	*	*	*	15	17	17	18	18	18	17	15	14	14
MIDDLE EAST (P)	*	11	13	16	14	*	*	*	*	*	*	*	*	*	12	14	16	16	14	*	*	*	*	*
CENTRAL AFRICA	20	19	17	15	12	12	11	*	*	*	*	*	*	*	17	19	19	19	19	20	20	20	20	20
SOUTH AFRICA	13	13	12	11	10	10	12	12	*	*	*	*	*	*	19	20	21	21	22	18	16	15	14	14
SOUTH EAST ASIA (P)	21	20	20	19	17	15	*	*	*	*	*	10	10	10	11	13	16	18	18	17	14	*	*	17
FAR EAST	19	19	19	18	16	14	12	11	10	10	10	10	10	10	10	12	12	12	11	11	14	19	19	19
AUSTRALIA	26	26	25	23	20	17	14	14	14	13	13	12	12	11	11	14	15	14	*	*	16	22	25	26
TO/FROM US MIDWEST																								
SOUTH AMERICA	20	18	15	13	12	12	12	12	11	10	8	10	12	16	19	20	20	21	22	23	23	23	22	22
WESTERN EUROPE	12	11	10	10	10	10	10	10	10	10	*	*	13	16	17	18	18	18	18	18	18	17	15	13
EASTERN EUROPE	8	8	8	9	10	10	10	*	*	*	*	*	*	13	15	16	16	16	15	14	12	*	*	*
MEDITERRANEAN	13	13	14	13	12	11	10	*	*	*	*	*	*	16	17	18	18	18	19	18	16	15	14	14
MIDDLE EAST (P)	12	12	13	13	12	*	*	*	*	*	*	*	*	13	15	16	18	17	15	14	*	*	*	12
CENTRAL AFRICA	19	17	15	14	12	11	11	*	*	*	*	*	*	18	19	20	19	20	20	21	21	20	20	20
SOUTH AFRICA	13	13	12	11	10	10	12	12	*	*	*	*	*	19	21	21	21	22	23	18	16	15	14	14
SOUTH EAST ASIA (P)	18	18	17	15	*	*	*	*	*	*	*	9	9	10	13	15	16	17	17	16	14	*	*	16
FAR EAST	19	19	18	16	14	12	11	10	10	10	10	10	10	10	12	12	12	12	12	12	15	18	19	19
AUSTRALIA	24	23	22	19	16	14	13	13	13	12	12	12	12	11	14	14	14	14	*	*	16	22	25	25
TO/FROM US EAST COAST																								
SOUTH AMERICA	16	14	12	11	11	11	11	11	10	8	8	11	15	18	19	19	20	21	22	21	21	20	20	18
WESTERN EUROPE	11	10	9	9	9	9	9	9	9	9	10	13	15	17	17	17	17	17	18	17	17	16	14	12
EASTERN EUROPE	9	9	9	9	10	10	9	*	*	*	*	12	14	16	16	17	17	17	16	14	12	10	10	9
MEDITERRANEAN	13	13	13	12	11	10	10	*	*	*	*	14	16	18	18	18	18	19	19	18	15	14	14	14
MIDDLE EAST (P)	13	12	12	12	11	*	*	*	*	*	*	14	16	17	18	18	18	18	16	15	14	14	13	13
CENTRAL AFRICA	17	15	14	14	13	12	13	12	*	*	*	18	21	22	22	22	23	23	23	23	22	22	21	19
SOUTH AFRICA	13	13	12	11	9	10	13	12	*	*	*	17	21	22	22	23	23	24	22	18	16	15	14	14
SOUTH EAST ASIA (P)	17	15	14	*	*	*	*	*	*	*	*	11	14	15	16	17	17	16	16	16	14	13	12	14
FAR EAST	18	17	15	13	*	*	*	*	10	10	9	10	12	13	12	12	*	*	*	*	15	18	18	18
AUSTRALIA	22	20	16	*	*	*	12	12	12	12	12	11	12	15	14	14	14	*	*	*	17	22	22	22

****Unfavorable conditions: Search around the last listed frequency for activity.***

PROGRAMMING SPOTLIGHT

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The Environment

Back in November, this column highlighted science and technology programs produced by international broadcasters. At that time, we confined ourselves to programs which treat the subject in its widest sense and promised we would revisit the topic to discuss more specialized programs later. Well, it is now later!

The state of the global environment is of widespread concern and several stations devote entire programs to it. Others that should, don't. But more on that later.

Radio Australia offers the program *Earthbeat*, which provides a weekly examination of environmental issues in the South Pacific region. It airs Sundays and Mondays at 2130 and Fridays at 0130 and 1030.

Last year, the **BBC World Service** decided to take a new tack on the subject by introducing *One Planet*, which focuses on the relationship between development and the environment at a "grassroots" level. The program goes on the Americas/Europe stream Tuesdays at 1830 and Wednesdays at 0330 and 1030. To Africa, *One Planet* is broadcast at Wednesdays at 0915 and 1930; while listeners to the Asia stream can hear the series at 0230, 0730, 1030 and 2130 each Wednesday.

Deutsche Welle's longstanding "flagship" ecology program is *Man and Environment*, which is heard around the clock and around the world each Tuesday at 0130, 0230, 0330, 0530, 0930, 2030, 2130 and 2330.

HCJB includes ecological and environmental reports in its Wednesday (Thursday UTC to North America) *Studio 9* program. The focus is on Latin America and the releases are at 0709, 0909 and 1909 Wednesdays; 0109 and 0409 Thursdays.

Even during its most desperate hours, **Radio Canada International** retained *Earth Watch* in its weekly schedule. *Earth Watch* places the stress on potential solutions to environmental issues and is broadcast Saturdays at 1205 and 2130* and on Sundays at 0230*.

Radio France Internationale features rather brief reports on environmental matters in its *Planet Earth* segment which airs during the second half-hour of its 1200, 1400 and 1600 transmissions on Thursdays and between 1700 and 1730 on Fridays.

Anyone with even a passing familiarity with **Radio for Peace International** would not be surprised to learn that the environment is a prime topic for this station's programming. *Every Living Thing* is a weekly half-hour that goes out Sundays at 1830, Mondays at 0230 and 0930, Wednesdays at 1900, and Thursdays at 0300 and 1000. A daily five minute report, *Earthwatch*, can be heard at 0755 and 2355. *Earthwatch* is also broadcast Mondays, Wednesdays and Fridays at 1840 and Tuesdays, Thursdays and Saturdays at 0240 and 0940. A weekly quarter-hour *Tropical Conservation Newsbureau Report* is devoted to regularly assessing the status of global rainforests. It airs on RFPI Mondays at 1845, Tuesdays at 0245 and 0945, Thursdays at 2100 and Fridays at 0500.

Apart from Radio Australia, another Asian view of the environment can be accessed through **Radyo Pilipina's** weekly program, *Save the Earth*, which airs at 0250 each Monday. In North America, this program is likely to be accessible only to West Coast listeners—and then perhaps only to those with a better than average radio and antenna system.

The environment in Scandinavia and environmental issues from a Nordic perspective are on offer each month via **Radio Sweden's** *Greenscan* program. It is presented on the second Thursday of the month at 1245, 1345, 1445, 1845*, 2045* and 2245*; and on the second Friday at 0145, 0245 and 0345.

Green Society is **Radio Vlaanderen Internationaal's** weekly brief on the state of the environment and environmental issues. It is broadcast Tuesdays at 1748* and 1848* and Wednesdays at 0848* and 1318*.

Given the environmental scars left by the Persian Gulf War in and around the Arabian Peninsula, it is not surprising that many of **Radio Kuwait's** programs discuss the aftermath of the war in terms of the damage to and attempts to repair the country's eco-systems. Radio Kuwait's English Service airs between 1800 and 2100 daily. **Radio Jordan** also has a weekly program on the environment called *Eco-Watch* which airs Wednesdays at 1230.

Emissions and Omissions

In this regard, one would think that the programming of eastern European, Ukrainian and Russian broadcasters would reflect some measure of concern about their ecological systems. The events at Chernobyl have continuing and lasting consequences. Russia and Eastern Europe contain some of the most polluted and environmentally poisoned places on the planet. Yet, apart from a few occasional reports, these stations (still government controlled for the most part) have done little to chronicle either the circumstances of the despoiling of their lands or the efforts that are and still need to be made to reclaim them.

Even more difficult to explain is the lack of this type of a program in the Voice of America's schedule. Given the leadership position of the United States in this sphere, a regular program devoted to discussing and describing environmental problems and solutions for an international audience would appear to be a natural for the VOA. The VOA would likely respond that it highlights environmental matters in its existing programs as warranted. The truth of that notwithstanding, a dedicated program would more clearly demonstrate the importance Americans place on the environment and more effectively serve as a catalyst for open discussion of these topics in the media of other lands. Isn't that the core reason for having a Voice of America?

Since that column in November, there have been some rather dramatic changes to that listing of general science and technology programs. **Deutsche Welle** dropped its series of quarter-hour science programs that rotated throughout each month and opted for a new weekly half-hour magazine-style program entitled *SciTech*. It airs Saturdays at 1115, 1615 and 1915 and Sundays at 0315. And, when the **Voice of Russia** reduced its English language service to eighteen hours a day, it retimed the broadcasts of its *Science and Engineering* program. It now can now be heard Mondays at 0411*, Tuesdays through Saturdays at 0511*, Mondays and Saturdays at 0711*, Wednesdays and Fridays at 0811*, Thursdays at 0911*, Tuesdays at 0932* and Mondays through Saturdays at 2111*.

Until April, good listening!

*(Days and times are in UTC; * denotes one hour earlier UTC during daylight saving time.)*

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QSLing "The Blanks"

Once you've been in the radio monitoring hobby for a short while, you are likely to run across a situation that Old Uncle Skip likes to refer to as "The Blanks." Allow me to explain.

Most monitoring logs — commercial, computer or home brew — allow you some place or other to check off when a QSL card (verification) or other form of confirmation comes back to you. As time passes and as your logbook grows, you will discover "The Blanks" — that insidious handful of signals that elude confirmation.

It doesn't matter if your particular radio monitoring poison is shortwave, amateur, medium wave, or even scanning. If you're into confirmation, any unconfirmed station represents a unique challenge. Even the greatest DXers to ever turn on a radio have to admit to a few "blanks" in their log book. This month's column will take a look at a few tips and tricks that can go a long way toward getting those blanks filled in in your own logbook.

If radio monitoring was as big a hobby as stamp collecting, it would make the whole confirmation thing so much easier. First off, every station you contacted would know exactly what you were looking for. Also, every postal authority would treat both your request and your returning QSL with the utmost respect and care. But, as you have probably figured out rather quickly, such is not the case.

Firstly, it is hard for beginners in this hobby to believe that the various radio stations we try to confirm often don't have the foggiest idea about our hobby or our desire for confirmation. Stations are in the business of producing programming for their identified audiences. They are not in the signal confirmation business. We hobbyists barely represent the smallest fraction of a percentage point of any broadcast station's audience.

Originators of other confirmable radio signals, such as utility stations or the business and public safety stations heard on a scanner, are even more confused about our hobby. Some folks can even get downright surly when they find out that someone other than those for whom their signal was intended was listening.

And then there is the postal system, both domestic and worldwide. Here in the United States we take for granted a postal system that usually gets the job done. The mail gets through in rain and snow and sleet and dark of night. Would that this were the case in all those other countries we radio hobbyists have to deal with. There are some countries in which getting a letter delivered faces worse odds than you could find at the casino gaming tables.

Now, these problems might make lesser people take up knitting. But remember, radio monitors are known for their patience and tenacity. The longest it has taken Old Uncle Skip to fill in one particular blank in his log book was *six years*! I also know of folks who have waited longer than that. Over time the blanks become true challenges, and the eventual success in checking off one more can be a great reward.

Getting that address

Many of the bigger shortwave broadcast outlets are well aware of the QSL process and regularly respond to confirmation. It's when you start to log those more regional outlets that things get tricky. If you are a shortwave broadcast monitor, two resources you need to get are the *World Radio TV Handbook* and *Passport to World Band Radio*. Both of these books can be found from many of the suppliers here in the pages of *MT*.

Both books give excellent information about accurate mailing addresses and even information on to whom one should send your reception report. Sometimes the problem is as simple as directing the letter to the right person.

Of all the various aspects of the radio hobby, nothing can beat belonging to a hobby-specific club that includes member's recent QSL successes. These will usually include the address, name, and the method of verification that worked. In many cases they will also include the time the mail route took, to give you an idea of how long to wait before sending out that second letter.

MT's "QSL Corner" column is an example of what you will find in more hobby-specific bulletins. For the shortwave hobby a great QSL column can be found in *The Journal* of the North American Shortwave Association (NASWA). The information in Sam Barto's "QSL Report" column has probably accounted for more than half the cards in my shortwave broadcast collection. Sam's been at this gig for twenty years now and nobody does it better.

You can get a look at Sam's work by requesting a sample issue of the NASWA *Journal*. Simply send $2.00 to the North American Shortwave Association, 45 Wildflower Road, Levittown, PA, 19057. Medium wave fans will find a similar occasional column in the National Radio Club's DX News called the "Confirmed DXer," most recently managed by Ken MacHarg (PO Box 5711, Topeka, KS 66605; send first class stamp for sample).

Although *MT*'s "Outer Limits" coverage has been curtailed, pirate radio fans can still get a monthly dose of QSL data along with the latest maildrop information — totally important to successful pirate QSLing — in John Arthur's "Veried Response" column in the pages of *The A*C*E Newsletter* (PO Box 12112 Norfolk, VA 23541; write for sample information).

What to say and how to say it

It certainly would help if everyone in the world spoke the same language but we all know that this is not the case. You may not have any way of assuring that the person on the other end knows English. One way to help with this problem is to take advantage of the multi-lingual confirmation forms made availible by some clubs and some commercial vendors. These sheets are usually set up as a fill-in-the-blank affair listing several major world languages such as Spanish, French and German, in addition to English. You may not know the local tongue, but a form including the major languages should get to someone who speaks at least one of them.

Another big part of the picture in filling in the blanks is some good old-fashioned "public relations." In sending out your confirmation request, take a good chunk of time and space to let the reader know about the hobby. Again, check with your affiliated clubs and see if they have any brochures or other handouts that you can include in your mailing to further elucidate your goals.

It often helps to tell the reader a little bit about yourself to make the whole process more personal. Don't get too specific. There

is a famous story in DXing circles about a hobbyist who found himself listed as a sponsor for a person trying to immigrate to the United States because things got a bit *too* friendly. This is also a good example of why it's recomended you do all your radio business through a Post Office Box as protection from much of the world's weirdness.

Also, in the case of broadcast stations, never forget the station's true intentions. Always give detailed comments about the programming you heard and what you enjoyed. The broadcaster wants to hear from listeners who have an appreciation for their hard work, not just for the strength and quality of their signal.

In the case of QSLing nonbroadcast stations, be sure to indicate that your intentions are honorable and that you have no desire to divulge the contents of the signal that you heard. Indicate clearly that you are simply seeking confirmation of your radio monitoring efforts.

Also in the case of nonbroadcasters, it is often helpful to include a preprepared verification card (PPV) — also called a prepared form card (PFC). Simply take a standard postcard (with appropriate return postage attached) and fill out the card with all the pertinent data needed to establish confirmation for your particular aspect of the hobby. This would usually include such things as station name or callsign, time, date, frequency, mode (AM, FM USB, etc.) and whatever else floats your boat. Make a clear place on the card for some station representative to sign off on the card.

In your confirmation letter where you take the time to tell them *why* you are seeking confirmation, politely ask them to check the data on the card and to send it back to you signed if the data is found to be correct.

Something even experienced folks forget to do is to request that the card be sent back informing the hobbyist if the data is *not* correct. We all make mistakes, and one way to get a "blank" out of your logbook is to know once and for all that it wasn't a good logging in the first place. You run across this a lot when sending out QSLs after a major amateur radio contest such as the ARRL Sweepstakes or the CQ Worldwide DX Competition. In the fast and furious pace that occurs during a contest, a few slips in the logging on either side of the QSO are bound to happen. Knowing that that rare one wasn't a good contact is disappointing, but it beats wondering what happened.

Going postal

Postage is another big issue when trying to fill in the blanks. The traditional thought has always been that you stuffed an International Reply Coupon (IRC) in the envelope going overseas and that was the end of it.

Well, ten years or so ago that may have been the case. In the past few years worldwide postal rates have fluctuated a great deal. A prime example is the new united Germany. If you expect a return from there to come by anything but a turtle with a bad limp, you need to include two IRCs to get the job done.

To avoid any question in this area, many savvy folks have shifted to the use of mint stamps from the country in question. Several resources for these stamps can be found, but I have always had consistent quality service from two longtime DX suppliers: William J. Plum, 12 Glen Road, Flemington, NJ 08822, and DX Stamp Service, 7661 Roder Parkway, Ontario, NY 14519. The few extra steps involved in supplying mint stamps can go a long way in solving "the blanks."

Some folks in the hobby debate the value of sending along a "greenstamp" (a U.S. Dollar bill) with a confirmation request. Some amateur radio DX operations more or less expect this as a way of offsetting costs. Old Uncle Skip totally disagrees with this practice. First off, many countries take a dim view of U.S. money coming in the mail. Secondly, sending money through the mail only increases the chances of your mail getting ripped off somewhere along the route, further reducing your chance of a return QSL.

It may be a vestige of "the sixties" running around in my brain, but I feel that money changing hands is not in the spirit of the hobby. Yes, there are a couple of notable "blanks" in my logbook because I don't subscribe to the greenstamp theory, but as far as I'm concerned they can stay blank. I'll work my way toward my awards by communicating to real amateurs and not "professional" amateurs. Let your conscience be your guide.

There are a few tips for domestic postal transactions that can help a great deal, too. Since the cost of postage has risen along with office costs, do the station on the other end the favor of including a self-addressed, stamped envelope (SASE). This cuts down on the amount of time they have to devote to our hobby (remember it's not *their* hobby, it's their livelihood). Take a similar tack with amateur radio operators. It used to be that hams swapped cards with little thought. But remember that postage on 100 cards is a minimum of $22.00 in domestic postage. That doesn't even consider the rising cost of having QSL cards printed. QSL cards are a matter of amateur pride, but they are also a real expense.

My own lifelong amateur radio policy is and shall remain that every station I contact will receive a card from me. However, if I expect a return QSL I always include an SASE, even on domestic contacts. As long as my meager radio writing puts a bit of extra cash in my pocket, I will always answer any card that comes my way, but I sure would appreciate an SASE to offset expenses.

Filling in "the blanks" can be a real challenge, but like so much that our hobby has to offer, it can also be a lot of fun!

ASK BOB
ANSWERS TO YOUR RADIO QUESTIONS

Bob Grove, W8JHD
bgrove@grove.net

CORRECTION:

In my January column, I erroneously listed the maximum permissible power in the Family Radio Service (FRS) as 100 milliwatts; that should have been 500 milliwatts (1/2 watt). A pair of good FRS transceivers is capable of line-of-sight communications of up to a mile or two. Distance is substantially reduced by trees, buildings, and hilly terrain.

Q. Can a nuclear test explosion be heard on shortwave or VHF? (Steve, KB8UUS)

A. Probably not over great distances. Decades ago, prior to the nuclear test ban, monitoring VLF frequencies for a rise in background noise was one method of detecting a possible nuclear detonation. But there are many causes for such increases, so it was not a foolproof indicator. There is local ionization around the detonation area which is bound to affect local radio propagation.

The explosion does, however, send out a high voltage electromagnetic pulse (EMP) of extremely low frequency (more like DC) which induces damaging currents in conductors for many miles around. This is the reason that "hardening" (shielding) of electronics is necessary in a nuclear conflict environment, but it's a very simple tactic of making sure that everything is in a metal enclosure, and there are no very long, unshielded cables interconnecting.

Q. Is there any way to eliminate the annoying icon which appears at the lower right-hand edge of a TV picture? Hopefully, it annoys my constitutional rights some way! (Glenn Bowman, Saline, MI)

A. Unfortunately, although the icon doesn't obliterate the picture, it cannot be removed; it is inserted by master control at the time of the broadcast, and is intended to discouraged unauthorized copying.

If it were "unconstitutional," then we'd *all* have something to say about commercials!

Q. What constitutes a good, medium wave, AM receiver? Does this also translate to good shortwave reception? (Tom Katzele, St. Croix Falls, WI)

A. In the U.S. medium wave broadcasters are separated every 10 kHz (9 kHz in Europe), so bandwidth filters don't have to be so sharply selective as on shortwave where broadcasting stations are separated by only 5 kHz. All general coverage, communications receivers have selectable filters which include approximately 4 and 6 kHz, adequate for both bands.

Portables, however, fail in many aspects, including dynamic range (the ability to withstand strong signal presence while attempting to listen to weak signals), adjacent channel rejection (selectivity), and even sensitivity

Bob's Tip of the Month

Changing the Factory Presets on the Sangean ATS 909/Radio Shack DX-398

Owners of the Sangean ATS909 and the private-labeled Radio Shack version, the DX-398, are told on p. 20 of their users manual under "Tuning Preprogrammed Shortwave Stations": "You cannot change the [212] preset shortwave stations stored in your receiver's memory."

Not true, says *MT* reader Bruce Hessenthaler, a Commerce, Michigan, communications engineer. Bruce's simple procedure is as follows.

1. In the SW mode, go to the desired "page number" where you plan to replace a factory preprogrammed frequency with a new one;
2. Tune in your new frequency on the display;
3. Press "M" (memory) and, while PAGE is flashing, press any memory location 1-9 where you want to replace the frequency;
4. If the location was previously empty, the new frequency is stored normally, just as the manual states, but if it's full, the prompt "MEMOFULL" will appear; in which case, proceed to step 5:
5. Continue to hold down the "M" key as in step 3 for about two more seconds, and the new frequency will overwrite the old one, indicated by the disappearance of the "MEMOFULL" message.

According to Bruce, the new frequencies are as indelible as the original factory presets, and even replacing batteries won't erase them—until you repeat the steps above. What a handy way to custom-program your shortwave portable's memory pages for DXing choices! Thanks for the nifty hint, Bruce.

when confined to using their internal ferrite-loop antennas.

One of the common complaints medium wave listeners lodge against many communications receivers is that they automatically switch in an attenuator to reduce signal strength while tuning medium wave. While this does limit sensitivity, with a reasonable outside antenna that is of no consequence. A noteworthy exception is the very affordable Drake SW8, an outstanding medium wave (and shortwave) receiver.

During the vacuum tube era, many Hammarlund and Hallicrafters receivers were popular for medium wave DXing, but there seems to be a lack of favorites among the current solid state genre.

Finally, audio quality may be an issue, but external speaker systems like the popular Grove SP200 Sound Enhancer can correct many ills of the receiver's internal speaker system.

Q. What determines the voltage of a cell or battery? (Mark Burns, Terre Haute, IN)

A. Several things, including the composition and concentration of the electrolyte (chemical), composition of the electrodes (positive anode and negative cathode), temperature, time (cells gradually self-discharge through internal resistance paths), and decomposition (the materials continue to interact until they neutralize each other).

The standard zinc-carbon, disposable (flashlight) cell, when fresh, registers a terminal voltage slightly above 1.5; as it discharges under normal load, it gradually drops over time. Highly active electrodes may produce higher voltages; lithium, for example, produces 3 volts.

Large flashlight cells produce more current (amperage) than small cells because their chemically active surface area is greater. But the voltage remains the same because that is determined by the chemical used for the electrolyte and the substances used for the electrodes, and those remain the same.

Strictly speaking, the term "battery" refers to "stacking" (combining) two or more cells; thus, there is no such thing as a type AA, AAA, C, or D flashlight "battery" since each of these electrochemical devices is actually one cell. Six- and twelve-volt lantern batteries, on the other hand, really are. And nine-volt batteries are aptly named as well, since they contain six teensy AAAA cells spot-welded together in series.

Car batteries, actually a series circuit of six two-volt cells, have so much "power" (amperage) because they have a much larger electrode surface for the chemical action to take place than, say, a flashlight cell.

Questions or tips sent to "Ask Bob," c/o *MT* are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of *MT*, or e-mail to **bgrove@grove.net**. (Please include your name and address.) The current "Ask Bob" is now online at our WWW site: **www.grove.net**

Kevin Carey, WB2QMY
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Pirate Beacons!

In this column we normally limit our discussions to signals below the AM broadcast band. From time to time however, an item comes along that, while not strictly longwave, is likely to be of interest to LF enthusiasts and other utility monitors. Hifers—short for "High Frequency Experimental Radio Stations"—fall into this category.

What are Hifers, you ask? In a nutshell, these are low power (1/2 watt or less) transmitters run by experimentally-minded people for the purpose of antenna and propagation studies. Transmitters are typically placed outdoors in small weatherproof enclosures and are battery powered. Some sites also include solar cells for battery recharging. The packages are discreetly placed so as not to attract attention from curious onlookers.

Despite their low power, Hifers can be heard hundreds of miles away under the right conditions. You may want to give these stations a try as an alternative to the traditional beacon chasing game. Your chances of hearing one are especially good if you live in the central or western U.S.A.

Some Background

Although unlicensed (and therefore illegal), Hifer operators are quick to point out that harmful interference is unlikely due to the low power being used and the careful choice of unoccupied frequencies.

A web site for Hifer activities can be found at: **http://home1.gte.net/intdec/hifer.htm**. It includes photos and detailed descriptions of several Hifer stations now on the air. The following text appears at the beginning of the web site:

"The lower frequency (below 10 MHz) HF amateur radio bands have become overcrowded and nearly impossible to experiment with very-low power (less than 1 watt output) radio propagation beacons and communications. Certainly, there is some 'QRP' (below 5 watt) two-way communications going on, but this is infrequent and not very consistent. And, there are not any low-powered, 24 hour/7 day a week transmissions occurring to study ionospheric propagation and/or to experiment with very weak-signal DXing techniques and experimental transmitter/antenna designs. Thus, Hifer operations are happening in increasing numbers on essentially empty HF frequencies. All Hifer Beacons are no more than 500 mW output power— most are 100 - 200 mW output. All are operating unofficially."

Where to Hear Them

The tables below list the stations believed to be active at this writing. Most operate 24 hours a day. According to the group's web page, Hifer reception reports may be sent to: P.O. Box 928, Lone Pine, CA 93545-0928.

73 kHz Resources

In the United Kingdom, a sliver of spectrum centered on 73 kHz has been allocated for experimental use. Some impressive distances have been covered using a variety of transmission modes and receiving techniques. For those interested in learning more about this band, there is now a web site devoted to the topic. You'll find it at: **http://www.qsl.net/k7on/qrp/experim.htm**. Thanks to Brian Short, K7ON, for providing this information.

Another useful resource for 73 kHz operation (or any longwave work) is the *LF Experimenters Source Book* published by the Radio Society of Great Britain. Chapters are included on antennas and propagation, transmitters, receivers, and test equipment. The cover price of the book is £7.50 plus £1.25 UK post and packing. It may be ordered from: RSGB, Cranborne Road, Potters Bar, Herts EN6 3JE, England.

Loggings

There's still time for some great winter DX on longwave. This month's loggings are all from outside North America and should provide some challenging, yet realistic targets for U.S. and Canadian listeners. Feel free to send me your best logs for use in a future issue of *Monitoring Times*. They may be sent via e-mail (see masthead) or by regular mail to P.O. Box 98, Brasstown, NC 28902.

Central/Eastern CA area:

Freq.	ID/Format	Farthest Heard	Power/Antenna
4095.9	27 dashes/min	—	400 mW, inverted vee
4096.1	90 dashes/min.	AZ	200 mW, dipole
6699.8	40 dashes/min.	AZ	200 mW, 15 ft. vertical
6283.0	RR-dash	500 miles	500 mW, 50 ft. wire

San Francisco Bay, CA area:

Freq.	ID/Format	Farthest Heard	Power/Antenna
7650.1	130 dashes/min.	CA	150 mW, wire ant.

Arizona:

Freq.	ID/Format	Farthest Heard	Power/Antenna
5621.4	ZA	AZ	180 mW, 90 ft. wire
4095.5	50 dashes	CA, OR, WA	200 mW, inverted vee
6851.3	50 dashes/min.	MD	200 mW, 15 ft vertical

Maryland:

Freq.	Format	Farthest Heard	Power/Antenna
6549	D	AZ	No other details available

DX BEACON TARGETS

Freq.	ID	Location
210	CLO	Cali, Columbia
212	UCF	Cienfuegos, Cuba
232	GT	Grand Turk, Turk Islands
232	UMZ	Manzanillo, Cuba
244	BA	Baranquilla, Cuba
268	UBY	Bayamo, Cuba
280	IPA	Easter Island
280	MID	Merida, Mexico
290	YNP	Managua, Nicaragua
292	MIQ	Maiquetia, Venezuela
300	ABL	Ambalema, Columbia
300	PPR	Pointe A Pitre, Guadeloupe
320	ZLS	Stella Maris, Bahamas
323	BSD	St. David's Head, Bermuda
330	CZM	Cozumel, Mexico
331	LAN	San Salvador, El Salvador
353	HOT	Higurote, Venezuela
367	HA	Hao Atoll, Fr. Polynesia
382	POS	Port of Spain, Trinidad
392	BZE	Belize City, Belize
402	C	Camaguey, Cuba
407	SWA	Swan Island, Honduras

Doug Smith, W9WI
72777.3143@compuserve.com

Digital Broadcasting in Canada

Those of you who've been reading this column for a few years know digital radio is on the way. Experimental digital stations are known to be on the air in the U.K. and Canada, and spectrum has been allocated in many other countries around the world. Now, the first applications for regular, commercial digital service in North America have been filed in Canada.

Here are just a few of the Toronto-area stations that will be carried on the new digital "multiplex" on the CN Tower.

Four L-band microwave frequencies will be used for digital broadcasts from the CN Tower in downtown Toronto. Each frequency (except the CBC's) will carry five different stereo programs simultaneously. 1456.304 MHz will be used by CHUM-1050, CFTR-680, CHUM-FM 104.5, CHFI-98.1, and CFNY-102.1. 1458.048 goes to CFRB-1010, CJCL-590, CKFM-99.9, CJEZ-97.3, and CJRT-91.1. 1461.536 MHz is the CBC's frequency, used by CBL-740, CJBC-860, CBL-FM 94.1, and CJBC-FM 90.3. The fourth frequency is 1465.024, which is to be used by CHIN-1540, CHOG-640, CHIN-FM 100.7, CISS-92.5, and CILQ-107.1. All four transmitters will operate at an effective radiated power of 5.084kW.

Canadian digital broadcasting uses the Eureka-147 system. This system has also been adopted by many other countries — in fact, the U.S. appears to be the only major industrialized country that's *not* using Eureka. Political considerations (including the fact that all stations in a city receive equal coverage under Eureka) are responsible.

Here in the U.S., experiments continue using in-band on-channel digital systems. These systems would maintain the relative coverage of stations. One firm has received a permit to use TV channel 6 in Washington, D.C., for digital experiments, under the rather exotic call of WZ3XZZ. Mexico is also considering digital. Canadian documents indicate Mexico has also adopted the Eureka-147 system for digital radio, so Canadian digital radios will work south of the border as well.

Expanded-band news

Another expanded-band station has appeared on the air. KGXL is the call being used by the station on 1650 kHz in Costa Mesa, California. Reports are that this station's coverage is much poorer than that of other expanded-band stations; indeed, I have yet to log KGXL here.

WTDY-1480 Madison, Wisconsin, has reportedly received its expanded-band transmitter (1670 kHz) and will probably be operating on that frequency by the time you read this. DXers have heard other unidentified tests in the expanded band. By summer, most expanded frequencies will probably have at least one operating station.

Most expanded-band stations are in the U.S., but there are a few in other countries as well. A handful of Australian stations have been reported — mostly with ethnic programming in various European and Asian languages. One more widely-reported station is Radio Esmeralda, a religious station in Buenos Aires, Argentina. This station rebroadcasts "Cardinal FM," 100.3 MHz, and has been heard on simple antennas in several parts of North America.

In early December, DXers in the Great Lakes area began noticing what they thought was a Canadian station on 1610 kHz, rebroadcasting Weatheradio Canada's 162.4 MHz station in Sarnia, Ontario. But... while there is to be a hearing in early 1998 on an application for an ethnic station on 1650 kHz in Toronto, there are not yet any authorized expanded-band stations in Canada. Toronto DXer Bill Hepburn finally tracked this station down — it was located in Port Huron, Michigan! While not totally unheard-of, these cross-border relay arrangements are rather rare.

Two of the most widely-heard expanded-band stations have been the DFW Airport operations on 1640 and 1680. Now, Allen Renner near Philadelphia has logged two new, similar stations. JFK International Airport in New York City operates a station on 1700 kHz with information on highway construction in the greater NYC area. Another station, on 1630, carries airport gate and parking information. Allen received a verification for the 1700 kHz (solar-powered!) station from Marianne Pellegrino, JFK International Airport, South Service Road, Building #14, Jamaica, NY 11430. Incidentally, Allen is one of many DXers to report new station WCMQ-1700 Miami.

EXPANDED-BAND CALLSIGNS

New callsigns are now being assigned to expanded-band stations:

New call/freq.	Old call/freq.	Location
WPHG-1620	WGYJ-1590	Atmore, Alabama
KSXX-1690	KRCX-1110	Roseville, Ca.
WCMQ-1700	WCMQ-1210*	Miami Springs, Fla.
KBGG-1700	KKSO-1390	Des Moines, Iowa
WEZI-1700	WSVA-550	Harrisonburg, Va.
KKWY-1630	KJJL-1530	Fox Farm, Wy.

*The old WCMQ on 1210 kHz has changed calls to WNMA and will reportedly become an all-sports station in English.

Bits and Pieces

In a verification letter for CBM-940, sent to Paul Ormandy in New Zealand, Quality Control Engineer Jimmy Siamoutas quoted target dates for several CBC stations moving from AM to FM. The two Montreal stations (CBM-940 and CBF-690) were to move to FM by Christmas 1997; CBJ-1580 Chicoutimi, CBV-980 Quebec City, and CBL-740 Toronto are all to move in 1998. A reminder: Canadian AM stations that move to FM usually simulcast on both bands for six months before shutting down the AM transmitter.

Sometimes, I fear I'm writing "*The Expanded-Band Times*"! While most of the interesting news has been in the world between 1600 and 1700 kHz, there has been plenty of DX in the more traditional part of the AM band. I'm sure many of you have been hearing some good DX in the regular bands, too. Let us know what's going on. Write: Box 98, Brasstown NC 28902-0098, or to 72777.3143@compuserve.com.

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
George.Zeller@acclink.com

Three Sources for Fresh Pirate Loggings

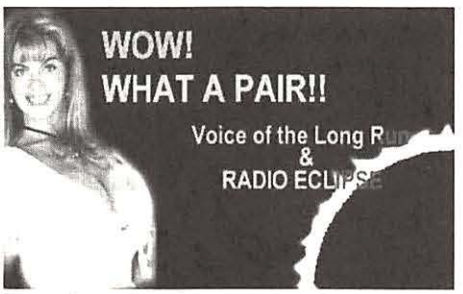
Some reshuffling at *Monitoring Times* necessitated a change in the amount of space available for the dozens of pirate loggings bagged by our readers. We will always cover the most significant developments in unlicensed broadcasting, but profiles on every currently active station don't fit on a page. Given the new format, all of us need a comprehensive source of information on recently heard pirates. Fortunately, three great ones are available.

The most thorough collection of North American pirate station loggings is in *The ACE*, published monthly by the Association of Clandestine radio Enthusiasts. Club President Pat Murphy of Virginia has energized this publication with improved content and features. The heart of *The ACE* remains Joe Filipkowski's "DiaLogs" column, which lists frequencies, dates, times, programming details, and maildrop contact addresses for virtually all North American pirates heard on shortwave. *The ACE* also offers John T. Arthur's semi-annual *The Directory,* a comprehensive list of pirates that use maildrop addresses for correspondence.

ACE membership fees are $21 to the United States, $26 to Canada and Mexico, and $40 elsewhere in the world, all in US funds. Sample copies are still $2.00. Send your inquiries to ACE, PO Box 11212, Norfolk, VA 23541.

If you can't wait until a new month rolls around for pirate news, check out *Free Radio Weekly*. Edited by veteran pirate DXers Chris Lobdell and Niel Wolfish, *FRW* summarizes loggings submitted by its members *every week.* Distribution is rapid via the internet. Best of all, the service is free to DXers who submit loggings! Non-contributors can get on the *FRW* e-mail list for a nominal $5.00 US annual fee. For *FRW* information, use **lobdell@tiac.net** or **niel@ican.net** for an e-mail inquiry.

Veteran pirate author Andrew Yoder's bi-weekly *Pirate Pages* combines logs from the *Free Radio Weekly* with other information sources. This one is conveniently distributed via the internet, but Andrew still maintains snail mail distribution for a fee if you lack computer access, or if your internet connection fails like mine did for a week when my computer acted up. Information on "*PiPa*" is available from Andrew at **ayoder@cvn.net** or via PO Box 109, Blue Ridge Summit, PA 17214.



Two pirates join forces.

Weiner Gets Construction Permit

Allan Weiner, famous for his links to pirate radio broadcasting for decades, has received an FCC construction permit for a licensed shortwave broadcaster in Maine. Allan plans a 50,000 watt station, with transmitter and antennas to be located on a farm in Monticello. Unlike his previous unlicensed operations such as **KPF-941, Falling Star Radio,** and the **Radio New York International** broadcasts from the ship *Sarah* anchored off Long Island, the new operation will be on a licensed basis. As progress is made on construction and testing, we'll keep you informed.

Radio San Marino

During the winter months, Europirate logs in North America are thrilling many of us. Chris Lobdell and Ross Comeau both heard the unusual **Radio San Marino** from a country that is quite rare on the shortwave bands. It irregularly uses 7580 kHz in lower sideband in the 2000-2300 UTC time frame. They accept e-mail reports via their **radiosanmarino@hotmail.com** address. If you're scanning for European pirates, reception is best in eastern North America, especially near the coast. Local sunset and sunrise on Saturdays and Sundays generate the most activity, with 6200-6400 and 3800-4000 kHz supporting the greatest volume of transmissions. Good luck!

North American Pirates

Monitoring Times readers heard over three dozen North American pirates this month, including Steve Mann's **Radio Eclipse.** The station has been airing joint operations with the **Voice of the Long Run,** as we see in their new combination QSL above. Despite announced plans by licensed Georgia broadcaster **WGTG** to test on 6955 kHz, this channel still supports over 95% of North American pirate activity. A noteworthy trend in early 1998 has been the return of bizarre early 1980's stations such as **The Crooked Man** and the old Radio Moscow parody, **Voice of Communism.**

It pays to check out the local medium wave (1600-1710 kHz) and FM broadcasting bands. Gerald Gibbs hears West Palm Beach, Florida, pirates on 915, 93.3, 96.1, and 103.9 MHz, while Jeff Ryan and Tom Morganelli report Philadelphia area signals from **WNQH** on 98.5, **WXFG** on 105.7, and another music station on 94.9 MHz.

We Thank Our Readers!

The success of the *MT* Outer Limits column always relies on contributions from our readers. We had another bumper crop this month: thanks! Reader input remains welcome via PO Box 98, Brasstown, NC 28902, or via the e-mail address atop the column. Here's this month's honor roll of DXers who sent in valuable material:

Joel Altre-Kerber, Buffalo, NY; John Arendt; Oswego, IL; Shawn Axelrod, Winnipeg, Manitoba; Kenneth Borndale, New York, NY; Ranier Brandt, Hoefer, Germany; Dean Burgess, Manchester, MA; Chip Cerelli, Westfield, NJ; Jerry Coatsworth, Merlin, Ontario; Ross Comeau, Andover, MA; Jim Cook, Ventura, CA; Joe Filipkowski, Providence, RI; Jim Franke, Bartlett, IL; Gerald Gibbs, West Palm Beach, FL; William Hassig, Mt. Prospect, IL; John Jenkins, Charleston, WV; Alan Johnson, Las Vegas, NV; Rich and Talea Jurrens, Katy, TX; Gerald Kercher, Quaker Hill, CT; David Krause, Eastlake, OH; Harald Kuhl, Germany; Tim Lemmon, Marietta, GA; Robert Lewis, Greenville, NC; Chris Lobdell, Stoneham, MA; Gigi Lytle, Lubbock, TX; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Anita McCormack, Huntington, WV; Tom Morganelli, Bethlehem, PA; Pat Murphy, Norfolk, VA; Gary Neal, Sugar Land, TX; Michael Prindle, New Suffolk, NY; Jesse Rose, Hampton, VA; Robert Ross, London, Ontario; Randy Ruger, North Hollywood, CA; Jeff Ryan, Yardley, PA; Brett Saylor, Whitehall, PA; Richard Sklar, Seattle, WA; Lee Silvi, Mentor, OH; Robert Thomas, Bridgeport, CT; Barry Williams, Enterprise, AL; Niel Wolfish, Toronto, Ontario.

Note to U.S. consumers only: It is unlawful to import, manufacture, or market cellular-capable or cellular-restorable scanners into the U.S.

Ike Kerschner, N3IK

Sobering Numbers

Have you tuned the 80 meter CW band lately? If you are an old timer I am sure you are wondering where all the signals have gone. When I started in this hobby over 40 years ago, it was almost impossible to find a clear frequency on 80. Today most of 80 CW is wide open. True, there are still traffic nets active daily, but the rag chewing and casual CW contacts are declining.

CW keys such as this one are still being manufactured, but they may become collectibles in a few years.

80 meters is not alone; most of the other CW bands are drying up. The level of CW activity is declining as the CW operators of yesterday pass on. That is not to say CW activity is dead — there is still activity and will be for years to come. However, fewer new hams are being attracted to this mode.

The reasons are obvious: first, the numbers of new hams are lower each year. Secondly, the Morse test has been reduced to a receive-only test which can frequently be passed by guessing; there is no requirement to learn how to send. As the one-minute solid copy requirement is no longer part of the exam, the no-code license is much more attractive to the average new ham. Lastly, the ability to talk to friends all over the world via internet makes ham radio and the required test a lot less interesting to would-be hams.

Is the Problem Serious?

Loss of CW activity in itself is not a serious loss to the amateur community. If 75 or even 100 percent of the present CW bands were turned over to voice or digital modes only, few of us would suffer great harm. However, the declining numbers of amateurs is a threat that cannot be ignored!

As in the decline of CW, the reasons for the decline in the number of new hams are many and varied — hence, there is no simple answer.

The no-code ham generally likes being able to keep in touch with local friends and only occasionally makes contact with hams some distance away. He has little interest in contesting, CW, or experimenting, and many no-code hams view the ham rig as a mobile telephone to keep in touch with family and friends. If allowed on HF frequencies, no doubt his presence would swell the bands and perhaps breathe a new life into our hobby.

Prospective hams with computers see little reason to turn to ham radio, as they have the ability to contact citizens in most countries of the world and enjoy hours of QRN- and QRM-free communication.

One other explanation for the decline in new hams is lack of knowledge about ham radio. For example, I work with a group of technically knowledgeable people. In discussions with them I found not one who knew what amateur radio was. Most thought it was CB radio, others thought it was a bunch of people who liked to listen to short wave broadcasts. When I explained the concept of ham radio to them most showed considerable interest and two even asked how to get into it.

The Media

Have you ever seen a newspaper or nonhobby magazine with an article explaining basic ham radio? Neither have I. (*Actually, I have; plus a couple of newspapers whose technology columns frequently address amateur radio topics - ed.*) The few articles I see do nothing to explain what amateur radio is nor what hams do; most are simply articles about field day or how Joe Jones talked to the space shuttle or the like. No explanations: just statements of fact.

It would be interesting to see what would happen if newspapers and magazines started talking about ham radio in a way that was easy for the average reader to understand. An article that tells what ham radio is, who hams are and what they do, and explains how you can get into ham radio might be just the medicine we need.

The ideal would be not just one article, but a weekly series explaining in simple terms the various aspects of our hobby. Such a series should use plain language and stress the fact that one need not spend kilobucks for a usable station. Each article should inlude the name of a contact person who can route interested parties to a local Elmer or club (I prefer one-on-one sessions).

The first step is to outline a series of articles that can be used, and get them into the hands of amateurs who have access to the media. A next step would be to form a group to assist one another in the effort.

If you are interested in helping to form such a group, please write me with your ideas and thoughts. My address is 6347 Chapmans Road, Allentown, PA 18106.

6 Meter AM

The January issue of *CQ VHF* carried an interesting idea about operating 6 meter AM (amplitude modulation). The author, Dave Booth KC6WFS, explains how he got into six meter AM and tells how you can join the fun by purchasing one of the older six meter rigs at your local hamfest. (They sell for twenty bucks and up.)

Dave suggests getting on 50.4 MHz (the AM calling freq) and calling CQ at least once a day. Dave has created a World Wide Web page for those interested in learning more: the address is **<http://www.geocities.com/Hollywood/5860/50am.html>** .

Conditions on all of the bands have been great during the winter DX season, with lots of DX being worked on 10 and a few decent openings to the northwest on six meters. We should see some super VHF openings within the next few months, so be ready for them. One suggestion is to keep a scanner operating on the VHF calling freqs. I also scan 29.5 and 29.6 MHz. on ten meter FM, since activity heard on ten meters means six may open shortly thereafter.

That's all for March, see ya in April. 73 Ike Kerschner, N3IK

Jock Elliott, KB2GOM
lightkeeper@sprintmail.com

Helping Traffic to Flow — with GMRS

In Southern California, there is a group of dedicated volunteers who are helping traffic to flow more smoothly with the help of GMRS.

What's GMRS? It's one of radio's great secrets: the General Mobile Radio Service. Originally known as Class A of the Citizens Radio Service, GMRS is a personal land mobile radio service available to individuals for short-distance two-way communications to facilitate the activities of licensees and their immediate family members.

GMRS allows communications with up to 50 watts of transmitter power through repeaters on the following repeater pairs:

Chan	Input	Output
1	467.550	462.550
2	467.575	462.575
3	467.600	462.600
4	467.625	462.625
5	467.650	462.650
6	467.675	462.675
7	467.700	462.700
8	467.725	462.725

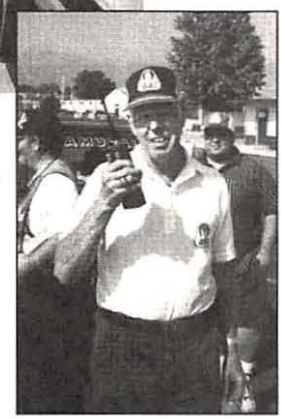
In addition, GMRS also allows simplex communications with up to 5 watts power on the following frequencies, which are the same as Family Radio Service Channels 1-7:

Chan	MHz
1	462.5625
2	462.5875
3	462.6125
4	462.6375
5	462.6625
6	462.6875
7	462.7125

Operating in FM mode with the option of using repeaters, GMRS can deliver crystal clear communications over ranges up to 50 miles. Because of its frequency allocation, GMRS communications do not "skip" as 27 MHz CB does.

Unlike CB, GMRS does require a license issued by the FCC, but, unlike amateur radio, there is no test to pass. All you have to do is fill out the licensing form correctly, fork over $70 (for your whole family for five years), and a license will be issued.

According to the Personal Radio Steering Group (the national advocacy organization for GMRS licensees), there are more than 3,400 GMRS repeaters in the United States,



Jay Eckstein, assignment editor for KABC-TV, is CREST team unit 7 and part of his impressive GMRS assistance. At right is Chuck LeBrun, CREST unit 30, with a typical GMRS radio.

representing an investment in communications infrastructure of more than $9 million. In 1997, PRSG reported that GMRS is "one of the fastest-growing, private wireless radio services, with more than 16,000 licensees."

In the late 1970s and early 1980s, Radio Emergency Associated Communications Teams (REACT) in Southern California began to see the potential of GMRS for performing their mission to provide communications assistance to the general public. The Repeater Users Group was formed to coordinate CTCSS tones used on the various repeaters owned by each group and to decide on a single calling format to be used by all teams using all repeaters.

At present, the Repeater User Group (RUG) consists of 25 repeaters operating on the 462.675 and 462.575 frequencies that are available for use by REACT members from San Francisco in the north, San Diego in the south, and Nevada and Arizona to the east.

According to Bob Leef, one of the guiding lights in this effort, "As more REACTers carried their GMRS radio while traveling the freeways, reports started increasing to base station monitors about accidents and incidents on the roadways. This happened at the same time that similar CB reports in our area were decreasing."

There are more than 20 teams within range of the GMRS repeater system, and dozens of individuals travel with GMRS radios in their cars. When they spot an incident, accident, or noteworthy situation on the highway, they use GMRS to report it to a base station, which in turn relays the information to the proper jurisdiction. Because the team members are trained observers who are already well versed in the information needed by the authorities, the reporting and relaying of information is swift and efficient.

In addition, the team with which Leef is affiliated, CREST, has seen to it that GMRS radios have been installed at Metro Traffic in Los Angeles, AirTraffic, KFI (a number one rated AM radio station), and Roaddirector. Metro Traffic and Air Traffic together supply freeway traffic updates to some 60 AM and FM stations that are tuned in by commuters.

When conditions warrant it, team members traveling the freeways use a special DTMF tone to alert the traffic information monitors. They can then rebroadcast the information and provide valuable "early warning" information to tens of thousands of people who are commuting. That helps commuters to avoid trouble spots and to keep traffic flowing smoothly.

Leef says, "Because GMRS rules are not the same as those governing hams, REACT members can handle 'business communications' with radio stations and at the same time reap the rewards of good exposure and PR through having a mention of 'and REACT reports that . . .' which is heard by thousands of people." Radio station KFI in particular gives on-air acknowledgment to REACT.

Whether or not they receive public acknowledgments of their efforts, the teams in southern California are clearly demonstrating that GMRS can be a powerful tool for helping the motoring public.

Anyone who wants more information on GMRS, licensing, radios, REACT, or RUG may write: CREST, PO Box 395, Corona, CA 91718 or visit their website at: **www.crest.react@juno.com**.

For information about GMRS or the Personal Radio Steering Group, write PRSG, PO Box 2851, Ann Arbor, MI 48106 or visit their website at **www.provide.net/~prsg**.

Clem Small, KR6A

Is Your Antenna Resonant?

Should you even care?

Almost every antenna is composed of one or more resonant circuits. These circuits are intended to give greatest signal output at a particular frequency* — the frequency for which the antenna is designed. Although there are some nonresonant antenna designs (such as the Beverage, the random-length and the active antennas), they are relatively few. This month let's discuss antenna resonance for receiving antennas.

Most of the antennas with which we deal are designed to be resonant at their frequency or band of operation. Note that the last sentence above says "designed" to be resonant. In point of fact many monitoring antennas and ham antennas based on resonant-antenna designs are not actually resonant at the desired operating frequency. This is because, although antennas are designed to work in an environment relatively free from conditions which can affect their resonant frequency and performance, practical environments seldom exhibit these conditions.

The factors which can interact with an antenna and affect its resonance or performance include inadequate height above the ground, nearby trees and vegetation, buildings or towers close to the antenna, and so forth.

Of course it is possible to measure an antenna's resonant frequency once it is installed. At that time you can tune it to the desired operating frequency if necessary. This raises two questions: how do we go about tuning an antenna if we decide to do it, and will such tuning give us better reception?

Yes, resonance makes a difference

If an antenna is designed and adjusted to be resonant at a certain frequency, then it will respond maximally to signals of that frequency. The antenna will deliver greater signal output for a given signal field-strength at the antenna.

If the antenna is a beam antenna, but not resonant at its design frequency, then the beam's functioning will suffer. Such parameters as gain, radiation-reception patterns, and front-to-back ratio will deteriorate progressively as the antenna's resonance moves farther from the antenna's design frequency.

Wire antennas longer than a half wavelength will not have their proper radiation and reception patterning if operated far from resonance.

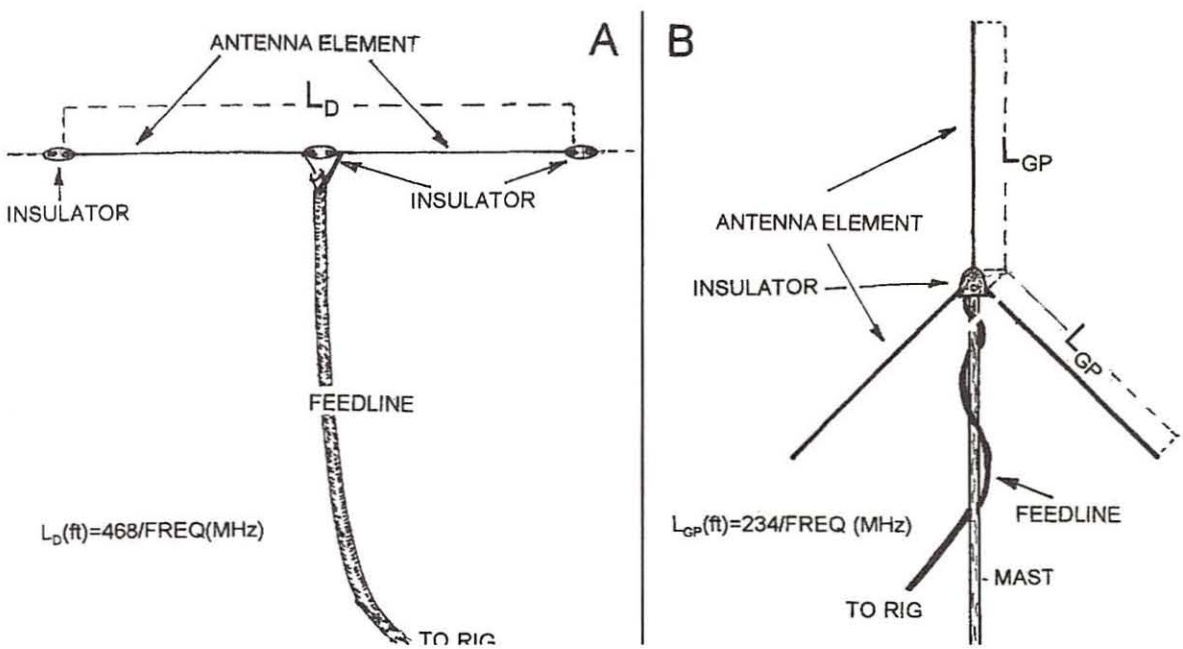
When received-noise is relatively high

Some hams and monitoring enthusiasts find it desirable to have a separate antenna tuned to resonance for each band which they utilize. But often there is no value, as far as reception is concerned, in making an HF or lower-frequency antenna resonant at its operating frequency or band.

Making an HF or lower frequency antenna resonant at the frequency of desired operation, or at the center of the desired band, will usually give a greater received-signal output at that frequency or band. But received-noise levels are usually significant on the HF and lower frequencies. Because of this relatively-high noise level on these frequencies, the quality of reception is usually determined by the signal-to-noise ratio (S/N). Thus, because making an antenna resonant doesn't affect the S/N, the increase in signal strength which it provides makes little difference in quality of reception. That is, the received-noise level is increased as the received-signal level is increased and the S/N is relatively unchanged.

FIGURE 1

Two resonant antenna designs: a halfwave dipole (A), and a quarterwave groundplane antenna (B). Are they **always** *resonant? See text.*



It is interesting to note also that, on any frequency or band, shortened antennas, loop antennas and high-Q antennas may have an unusually low signal output when tuned off-resonance. Therefore, they do not fit the generalization that tuning an antenna to resonance is not useful for improving reception on the HF and lower bands. Such antennas used on any band may not perform well if they are not resonant at the frequency of operation.

When received-noise is relatively low

There are locations where received-noise is relatively low. Sometimes this includes upper portions of the HF band; almost always it includes the VHF band and higher frequencies. For low received-noise locations, the increase in signal strength due to making the antenna resonant can significantly improve quality of reception for moderate-strength or weak signals.

Tuning an antenna to resonance

The SWR-measuring devices** mentioned last month can be used to measure an antenna's resonant frequency(s). Basically, the point(s) of lowest SWR indicate the antenna's resonance(s). Multiband antennas have a resonant point for each band. Broadbanded antennas may have multiple resonant points spaced closely together.

To bring capacitor-tunable or high-Q coil-loaded antennas to resonance you should follow the directions given with the antenna. Decreasing capacity of the tuning capacitor or reducing the inductance of the tuning coil will raise an antenna's resonant frequency. Increasing the capacitance or inductance lowers the frequency. A coil's inductance can be reduced by spreading its turns apart, or reducing the number of turns used. The inductance can be increased by pushing the turns closer together, or adding turns.

In general, wire antennas with no tuning circuits can be brought to resonance by lengthening an antenna which resonates above the desired operating frequency, or shortening an antenna which resonates below the desired frequency.

What about transmitting antennas?

Obviously the S/N is not a consideration for transmitting antennas: Our main concerns for these antennas are such things as radiation and reception patterning, antenna efficiency, transmission-line loss, and power-handling capability. Perhaps we can discuss transmitting antennas another time. For the present, suffice it to say that, for various reasons, it is usually desirable that transmitting antennas be resonant. Nevertheless, they can be used at frequencies at which they are not resonant, but some form of "antenna tuner" or matching circuit is then necessary.

And yet ...

In this practical world where most of us live, we may not have the time and/or money it takes to make sure that our antennas are resonant. But, before we despair of ever having a worthwhile antenna, it is important to realize most antennas function reasonably well, resonant or not.

Also keep in mind that just about any antenna can function to some degree and give worthwhile service if treated properly. To illustrate this point, the formidable Kurt N. Sturba and Lil Paddle frequently report using such remarkable antennas as a metal lawn chair or metal grocery cart as an HF antenna for both transmitting *and* receiving. And, using such antennas, they repeatedly communicate with far away places with strange sounding names.

True, there are *better* antennas than lawn chairs and grocery carts, and they well know that. But the point is that you can do a lot of monitoring or communicating and have a lot of fun with much less than an optimum antenna.

So, whether your antenna is resonant or not, happy monitoring!

RADIO RIDDLES

Last Month:

I asked "So we can sometimes get away with ignoring SWR values on some receiving antenna systems. But how about resonance? Can we ignore that? Should our antennas be resonant at the desired operating frequency?" Obviously we just answered that question above.

This Month:

• Tuned circuits in trap antennas do not necessarily give maximum output at signal frequency. What do they do?

You'll find an answer for this month's riddle, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, 73

** Autek Research, P. O. Box 8772, Maderia Beach, FL, 33738, phone, 813-886-9515; MFJ Enterprises, Box 494, Miss. State, MS, 39762, phone -601-323-5869; AEA, Division of Tempo Research, 1221 Liberty Way, Vista, CA 92083, phone 1-800-258-7805

Bill Cheek
email: bcheek@san.rr.com

WiNRADiO Secrets Unveiled

Take cheer — spring is just around the corner! For those with cabin fever, here is a ray of sunshine to disperse those cold winter shadows. A sharp software engineer, whom I'll call "Dr. Di Mento," just penetrated some of WiNRADiO's file mysteries and unleashed a formidable power to an already powerful radio. First, let's peer into the background.

Behind the Scenes

WiNRADiO installs a minimal, but well-organized set of files, most of which offer little or no clue to their purpose and use. Most likely, the factory doesn't intend for operators to "use" any of these files except for the Help and the executables. Thanks, however, to "Dr. Di Mento," we now can use some of those files to great advantage. But before we expose these secrets, let's identify the locations and purposes of the WiNRADiO files.

The WiNRADiO files are listed in Table 1 by name, location, and purpose. Let's start at the bottom of Table 1 and work up. The Windows *system.ini* file is changed at the time of installation of WiNRADiO. An unaltered backup copy is created as system.00n where "n" is a number. If you already have *system.ini* backups numbered *.001, *.002, and *.003, then WiNRADiO creates *.004. If anything ever goes wrong with the installation or if you need to reinstall, you can delete the current *system.ini* and rename the last numbered backup to *system.ini* to restore preexisting conditions. Don't tamper with these two files unless there is a reason.

WiNRADiO, under Windows 95 and Windows NT, installs two shortcuts (*.lnk), one in the Start Up menu and one on the Desktop. During installation, a setup applet, *wrconfig.cpl*, is installed in the Control Panel by which you can select the I/O port, usually 180h. This and four other WiNRADiO system files are located in the \WINDOWS\SYSTEM directory and should never be tampered with or moved. You will, however, want to know the location of WiNRADiO's initialization file, *winradio.ini*, and refer to it upon occasion. You can display, study, and edit it with the standard Windows *notepad.exe*.

WiNRADiO can be uninstalled from the CONTROL PANEL > Add/Remove Programs applet. You should not execute the *unwise.exe* uninstaller directly. A *readme.txt* file in the \WINRADIO directory offers the latest information at the time your WiNRADiO was packaged. A standard HELP file is included as *winradio.hlp*. You can double-click it or access it from the WiNRADiO menu bar under the Help item.

winradio.exe is the main executable. You can run it with a double-click; or from the RUN command line; or from a DOS command line; or from the shortcuts. The four secret files in Table 1 are discussed ahead.

TABLE 1: WINRADIO FILES & LOCATIONS

LOCATION or DIRECTORY	FILENAME	PURPOSE
\WiNRADiO	winradio.wrm	*Memory file*
\WiNRADiO	autostep.wrf	*AutoStep file*
\WiNRADiO	exclude.wrf	*Exclusions file*
\WiNRADiO	freqscan.wrf	*Scan file*
\WiNRADiO	winradio.exe	*Main program*
\WiNRADiO	winradio.hlp	*Help File*
\WiNRADiO	readme.txt	*Latest info text file*
\WiNRADiO	unwise.exe	*Uninstaller*
\WINDOWS	winradio.ini	*WR Initialization file*
\WINDOWS\SYSTEM	winradio.386	*WR system file*
\WINDOWS\SYSTEM	wrapi.dll	*WR system file*
\WINDOWS\SYSTEM	wrapi32.dll	*WR system file*
\WINDOWS\SYSTEM	radioapi.dll	*WR system file*
\WINDOWS\SYSTEM	wrconfig.cpl	*Control Panel Applet*
\WINDOWS\Start Menu\Programs	winradio 2.12.lnk	*Start Menu Shortcut*
\WINDOWS\Desktop	winradio 2.12.lnk	*Desktop Shortcut*
\WINDOWS	system.ini	*WR edits this file*
\WINDOWS	system.002	*Backup SYSTEM.INI*

Always retain (*unaltered*) the last two files above, these are *Windows* files. If anything ever goes wrong, then delete system.ini and rename system.002 to system.ini . All other above files can/should be deleted if WiNRADiO ever needs to be reinstalled.

WiNRADiO's Weaknesses

WiNRADiO, for a $500 wide spectrum receiver, doesn't have showstopper weaknesses in view of its strengths. One lame aspect, however, is the manual labor to build up a functional set of operating frequencies, search bands, and scan or search step increments.

By that, I mean WiNRADiO offers no way to automate the importation or use of external frequency databases and lists. Even if you have the PerCon, ScannerBase, or Grove FCC databases on disk or CD-ROM, you still had to manually enter data into WiNRADiO. But no more!

The Hot Files

WiNRADiO's data is contained in the top four files shown in Table 1. The first, *winradio.wrm*, is the memory file, a proprietary format file that cannot be readily edited or accessed except by the WiNRADiO built-in user editor. A memory file can hold up to 1000 entries, but that means a lot of keystrokes. Then, considering there is no limit to the number of memory files, the work can be a burden!

Another important file is *autostep.wrf* that holds definitions and setups of all the specialized bands and sub-bands in WiNRADiO's 500 kHz-1300 MHz range. Since these ranges differ from one region to the next, there's no way for WiNRADiO to "know" what's right for you. When properly configured, auto-stepping automatically sets the frequency step increment according to the band for the displayed frequency. For example, the 540 - 1700 kHz AM broadcast band in North and South America has 10 kHz steps or increments. Elsewhere around the world, it's 9 kHz.

When tuning this band, there is no sense in tuning any increment but 9 or 10 kHz. On the other hand, you'd probably want to tune in 2.5 kHz steps immediately below and above this band. The step increments differ widely, depending on the band. There are at least 250 bands or sub-bands in the 500 kHz - 1300 MHz spectrum and each has different parameters of step increment, mode, and bandwidth. WiNRADiO's Auto-Stepper allows a precise and specific setup for each of these bands, but just like the memory file, the *autostep.wrf* file has to be manually configured from the keyboard.

An interesting file is *exclude.wrf*. You can specify the lower and upper limits of a frequency range to ignore while scanning or searching. This exclusion information is stored in *exclude.wrf*. Exclusions are usually minimal and not a problem to set up by conventional manual methods.

Last, but not least, there is *freqscan.wrf*, a file that holds information about the scanning ranges that you've set up. Setup labor isn't a problem for only a few scanning ranges, but if your interests are wide and varied, you could conceivably have hundreds of scanning ranges, and the setups could be sheer drudgery.

The Secret

Thanks to "Dr. Di Mento," we can now create these WiNRADiO files with automation, and avoid much of the manual drudgery of keyboarding. We can now easily and painlessly extract information from WiNRADiO's *.wrm and *.wrf files as well as create or recreate them. "Dr. Di Mento" even hammered out a means to append (add) information to these files by automation.

We can now use frequency data extracted from the PerCon, ScannerBase, or Grove FCC Databases and zap it into WiNRADiO in the twinkling of an eye. "Dr. Di Mento's" process uses the little known Perl translator and a set of Perl scripts to convert simple comma-delimited ASCII or dBase *.dbf files into just the right format for WiNRADiO.

What Is PERL?

Perl is a Practical Extraction and Reporting Language, but forget about that. "Dr. Di Mento's" few simple docs will guide you to success. I guess you should also know that Perl is freely available under the terms of either an Artistic License: **(http://www.activestate.com/corporate/artistic_license.htm)** or the GNU General Public License: **(http://www.activestate.com/corporate/gnu.htm)**. This is a long-winded way of saying that Perl is free to the user. "Dr. Di Mento's" Perl scripts are also free. All you need is a WiNRADiO.

The Perl Scripts

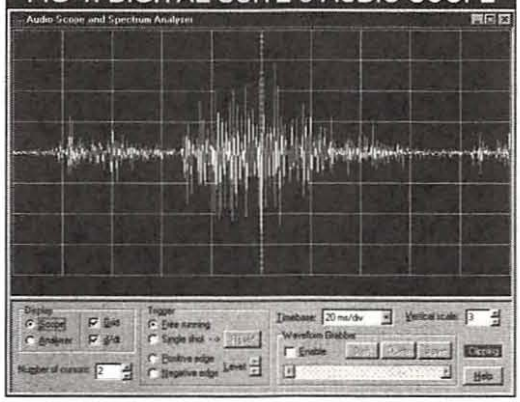
A Perl script is just a set of instructions that are carried out by the Perl executable, neither of which is of the least interest to us. We need only launch a DOS window under Windows and type in a brief command-line instruction similar to the following:

Perl.exe writewrm.pl -o outfile.wrm freqfile.txt

This command creates a new WiNRADiO memory file, *outfile.wrm*, from an input text file, *freqfile.txt* .

You'll need "Dr. Di Mento's" Perl scripts and a Perl translator (the Perl executable). But relax; none of this is complicated or costly.

FIG-1: DIGITAL SUITE's AUDIO SCOPE



You can download "Dr. Di Mento's" Perl scripts and a Perl translator from my FTP site as follows:

Perl translator: ftp://204.210.10.52/pub/winradio/perl95nt.zip

WiNRADiO scripts: ftp://204.210.10.52/pub/winradio/wrcnvprl.zip

I will also send these files, upon request, by e-mail file attachment (about 325-kB), or mailed on a 3.5" floppy disk for $4, ppd. If you already have a Perl.exe translator, it should work fine. The WiNRADiO scripts alone are about 25-kB.

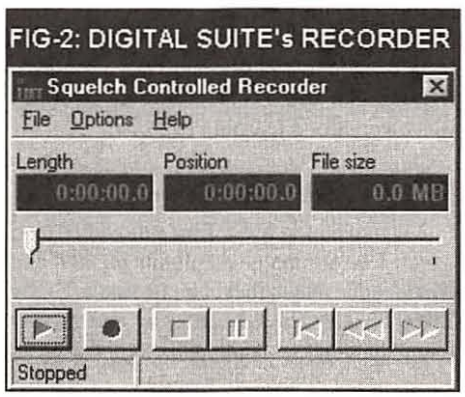
Conclusion

"Dr. Di Mento's" Perl scripts make it easy to create a complete operating package for your WiNRADiO in no time. When your interests or needs change, you can revise the operating files just as quickly. The sweet spot is that you don't have to know a thing about Perl and Perl scripts. WiNRADiO just took a quantum leap.

Hot New Goodies

WiNRADiO Communications now offers the hot new Digital Suite, an add-on ensemble of power modules for their regular software package. The Digital Suite consists of a handful of applets to enhance and assist in the acquisition and decoding of digital signals. The suite comes with an Audio Scope and Spectrum Analyzer; DTMF Decoder; CTCSS Decoder; Packet Radio Decoder; ACARS Decoder; FAX Decoder; Signal Classifier; and a Squelch Controlled Sound Recorder!

FIG-2: DIGITAL SUITE's RECORDER



For more information on the Digital Suite, see: **http://www.winradio.com/home/ds.htm** or stay tuned for a product review here in *Monitoring Times*.

WiNRADiO Communications has also released v2.20 of their regular software package, freely available as *wr1000-220.zip* for download from: **http://www.winradio.com/home/download.htm**

I'm happy to freely provide e-mail support for "Dr. Di Mento's" WiNRADiO automation as well as for all my articles and projects. Make questions pertinent and focused and I'll respond in short order.

E-mail: bcheek@san.rr.com
WWW: http://204.210.10.52
FTP: ftp://204.210.10.52
FAX: (619) 578-9247 anytime
Postal: PO Box 262478; San Diego, CA 92196-2478

Rich Arland, K7SZ
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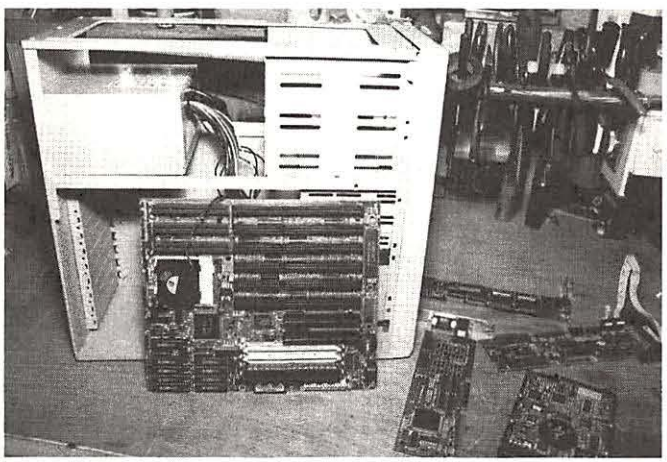
Computers in the Radio Shack

Computers have become a way of life in the radio room over the last ten years. While I use a 486DX66 for most of my computing needs, my "radio shack" still has a couple of outdated work horses that I acquired for pennies on the dollar.

My main station computer is an ageing 486DX66 clone that I built up from parts. I picked up a new minitower box and power supply for about US$20 at the York (PA) hamfest last August. My next door neighbor, Dave Carey, N3PBV, had a bunch of computer "stuff" left over after cleaning out his office and sent it my direction. In the box of cast-off computer boards was a 486DX66 motherboard with 16 mb (megabytes) of random access memory (RAM) on board. This became the heart of my new computer.



My new 486 computer. Leaning against the mini-tower case is the motherboard. To the right are all the circuit cards to make things work. Will they all fit?

One of my coworkers had purchased several small (170 mb) hard disk drives and wanted to sell off two of them for US$45 each. This was an excellent buy, as I had been looking for something like this to replace the 212 mb drive in my other computer. Dave had thoughtfully included a hard disk drive (HDD) controller card in his box of goodies, so it was a simple process of hooking everything together and getting it to play.

Floppy drives are dirt cheap. I picked a new Teac 3.5-inch (1.44 mb) floppy drive up for US$19 and had another 5.25-inch (1.2 mb) floppy laying around the shack. These are driven by the HDD controller card, so there was nothing else to buy. Just plug them in and identify them in the setup routine.

Modernizing

Many programs are now being issued on CD-ROM. By careful shopping around at computer fairs, ham radio fleamarkets, and local computer retail outlets, it is entirely possible to find a 2x, 4x or 8x CD-ROM drive for under US$30. Typically, these are driven by the sound card. While SoundBlaster™ cards are expensive, clones of these cards are around US$25 or less. Hence, for around US$50 you can equip your computer with CD-ROM capabilities.

Finally, Dave had an old variable-graphics-array (VGA) monitor sitting around, so I ended up with a color monitor for my "new" computer. I had a 101-key keyboard laying around from an old PC AT clone. About the only thing lacking is a 33.6/56 kilobyte (kb) modem. I am looking diligently and will add a modem when I can find one for a reasonable price. Anything slower than 33.6 kb is not worth putting into a computer that you are planning to use for Internet connection.

It took me a while to gather all the bits and pieces to build up my new shack computer, but it was well worth the wait. In addition, I was forced to learn a lot about computers just to make everything play together. There are several good books on the market about upgrading and repairing PCs, but these are all in the US$50 plus price range. Instead, I opted for a series of reprint articles from one of the computer magazines (US$5.95) that very plainly explained exactly how various parts of the computer work and how to upgrade and install new HDDs, floppies, memory, CD-ROM/sound cards, etc. The entire project was a very good learning exercise.

I love laptop computers.

My first laptop was a Tandy model 102, on which I wrote many a column for *MT* and *Worldradio* magazines. Next came a Tandy 1500 HD. This I bought on "sale" and quickly found that it was not only obsolete (it used an NEC V-20 central processing unit [CPU] running at 10 MHz) but it ate batteries like mad! Even so, I used it for several years to write columns, do satellite tracking, logging and packet radio.

Thanks to Cam Hartford, N6GA, and his many trips to the Livermore (CA) swapmeets, I have two little Toshiba laptops: a 1100 and a 1000. Both of these machines cost about US$40 each and feature liquid crystal display (LCD) screens and extremely low power consumption. I can get about six hours use on either machine with a full charge on the internal batteries.

If there is a downside to using these older, less sophisticated machines, it is their slow processor speed, lack of color display and — in the case of the Toshibas — no hard disk drive. Also, you will be working with DOS (disk operating systems) and not Windows. However, one learns to cope.

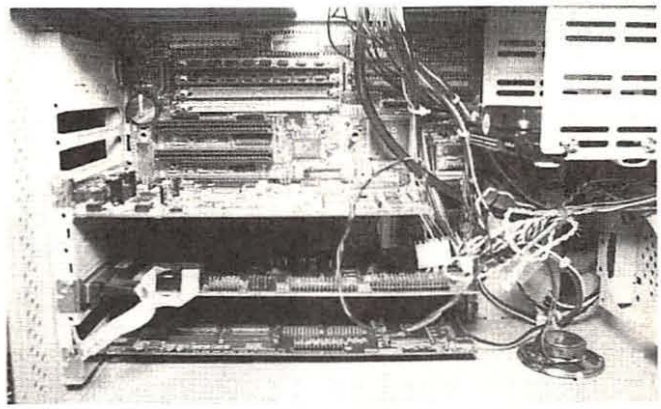
One additional problem that can be encountered is the lack of RAM available to run big programs. The Tandy 1500 HD and both the Toshibas only have 640K of RAM available; therefore, you need to insure that any programs you are planning to run will fit on the machine.

My Toshiba 1100 has dual 3.5-inch 720K floppy drives and no hard drive. You must use a "system" disk (one with DOS system files embedded on it) to initialize the machine. The actual software is loaded in on the "B" drive, or if you are creative, you can tailor the DOS system files to only include the bare essentials for computer operation and include the actual software on the system diskette.

The 1100 has an RS-232 serial communications port, so it is a natural to hook up to a packet Terminal Node Controller (TNC). The low power requirements of the 1100 make it especially useful for portable packet during emergencies, Field Day or emergency drills.

The Toshiba 1000 is a recent addition to the shack. After rebuilding the battery pack this little gem continues to run like a top. This machine is now with my daughter, Wendy, KB4UNT, serving as a packet terminal at her station.

■ Selected Software



Yes, it all fits! Motherboard is in the back and the various circuit boards are horizontally mounted. The 70 mb hard drive is shown in the right center of the picture.

Today there seems to be an abundance of software on the market for the radio aficionado. It was not always so. Thankfully, many of the dreary tasks, such as logging shortwave (SW) programs or amateur radio contacts, can be accomplished via some rather sophisticated software that not only keep track of your countries heard/worked, but tallies up information needed for various shortwave/ham awards.

One program that I found very interesting is called *Voyageur* by Orchid City Software.[1] This program features a utility logging routine that facilitates logging SW transmissions and generating reception reports for submission to the shortwave station. In addition, there are several large databases that yield helpful information on international SW broadcasters, their addresses, listener DX programs (sorted by day, frequency and station), etc. Voyageur is a very nice piece of radio software that will run in DOS or Windows 3.1 or 95.

Another program that I use continually is LOG-EQF, written by Tom Dandrea, N3EQF.[2] This is a nice shareware ham radio database logging/awards tracking program that is inexpensive (about US$40) and very easy to learn. It tracks Worked All States (WAS), Worked All Continents (WAC), DX Century Club (DXCC), can generate QSL (verification card) labels, interfaces with other major ham database programs, offers a Morse code (CW) keyer, and will control many of the newer rigs that offer PC control.

While there are an overabundance of propagation programs on the market, I have used W6EL's MiniProp Plus[3] for a number of years with great success. MiniProp Plus will run on older, IBM PC-XT/AT computers and all the newer processors. Sheldon Shallon, W6EL, has done an outstanding job of providing a very functional piece of propagation software that is quick and easy to use.

The packet radio software I use, "PAKET" by Tony Lonsdale, VK2DHU,[4] sits on the system boot disk. PAKET is a very small, easy-to-use program that offers a host of features. I like PAKET because it runs on my Toshiba laptops without having to delete any program files or attempt to "shrink" the size of the original program. On the other hand, it can also run on my 486DX66 or a Pentium machine.

The American Radio Relay League[5] (ARRL) has an outstanding selection of software included in some of their publications. In addition, the ARRL offers back issues (currently from 1950 to present) of their magazine *QST* on CD-ROM. This is a tremendous way to collect back issues of *QST* without incurring the problem of storage. ARRL software packages also include Novice, Technician, General, Advanced and Extra Class study guides with tests, back issues of *QEX* and *National Contest Journal*, the repeater atlas/trip planner and the *Radio Amateur's Handbook*, all on CD-ROM.

Satellite tracking software is available from advertisers in *Satellite Times* or AMSAT.[6] Any orbit tracking software purchased from AMSAT will aid the amateur satellite program. I have used *Instatrack* and *Orbits-II*, both available from AMSAT. Depending upon the level of sophistication desired, either program will fill the bill for tracking satellites orbiting the earth. In addition, Instatrack also offers sun and moon tracking, something that Earth-Moon-Earth (EME) communications enthusiasts need.

In keeping with our **K.I.S.** principles, if you desire to add a computer or two to your shack, shop around. Check out the flea markets, hamfests, computer shows and computer retailers who often dump older equipment that they replace for clients. You should be able to come up with the computer system you need at a fraction of the original cost. Look around...and remember, *Keep It Simple*. Until next time, 73 Rich.

Footnotes

[1] Orchid City Software, PO Box 18402, West Palm Beach, FL 33416

[2] EQF Software, Tom Dandrea, N3EQF, 396 Sautter Dr, Coraopolis, PA 15108

[3] Sheldon Shallon, W6EL, W6EL Software, 11058 Queensland St., Los Angeles, CA 90034-3029

[4] M.A. Lonsdale, VK2DHU, 6 Marsden Cres, Port MacQuarie, 2444 Australia (e- mail: tony@portmac.apana.org.au)

[5] American Radio Relay League, 225 Main St, Newington, CT 06111

[6] Radio Amateur Satellite Corp, 850 Sligo Ave, Suite 600, Silver Spring, MD 20910 (internet: **www.amsat.org**)

John Fulford, WA4VPY
email: JOHNF0413@aol.com

Nextel Forces the Digital Switch

In recent columns we have been discussing the lack of activity on the federal bands, coupled with the increasing visibility of federal personnel using radios resembling cellphones supplied by Nextel. I have received correspondence from more than one monitor that they have been on the scene of events which have involved federal personnel and have observed *NO* communications on the federal government radios. What they have observed is the feds using Motorola radios which look like late model cellphones but which are used in two-way fashion.

The other day I was in the elevator of the building where I work on a large university campus here in South Florida. I had occasion to be sharing the elevator with two people from our school maintenance department. Both of them were carrying these radios.

Not one to miss a chance to examine new marvels of communications equipment, I asked them if they would come over to the electronics lab where I reside during working hours and let me see one of the radios. I told them our department was interested in getting a radio system. (What I didn't tell him was that we already use a simplex channel in the 154 MHz band...Oh well...)

Examination of the radios, which had the Motorola logo on one and the Nextel logo on the other, revealed several interesting features. The radios have a liquid display on them with several displays highlighted. The highlighted information showed what amount to fleets and subfleets. This pairing is reminiscent of the Motorola STX-821 and the TrunkTracker.

I had the supervisor show me how they worked. He went through the same fleet and subfleet procedure as a normal trunked radio, showing me how he could contact different personnel individually or as a group call. He also showed me the telephone interconnect feature.

I asked him if he knew the location of the base station. He said they had a small base unit in the office of the maintenance department but that the transmitters were on the large black tower off in the distance. This is the Nextel tower located along I-95 in Delray Beach, Florida. He further informed me that all of the maintenance personnel had gone to a training class given by the local two-way shop (also Nextel?) in the use of the radios before they were assigned out to the personnel.

While he was showing me the features and demonstrating their usage, I had the spectrum analyzer hooked up. I set my scan limits as being between 850 and 870 MHz. When he keyed up I found them. Guess what? They were digital. I had a feeling that was coming. I thanked him for his time and he went on his way.

I guess a change in our monitoring habits is due. Nextel has gone around the country and purchased all available trunking licenses from Motorola. Systems that were operating in the analog mode will be switching over to digital. All new subscribers on the Nextel system must use digital radios.

I don't usually recommend equipment ...

There will be a few privately owned systems that Nextel did not purchase and they will continue using the older analog format. My trunked radios are safe until my system owner sells out, but the digital future is coming.

So there you have it. The feds have indeed gone up to 800 MHz trunking and the system is, for the most part, digital. I imagine if one takes time to examine the federal data base of contracts which have been put out by the government, which is available on the Internet, one will find the Nextel contract. I have a feeling it is the same throughout the country.

This would certainly make sense, as we addressed in a previous column. An agent from South Florida might be temporarily assigned to another geographic area. He would take his Nextel unit with him and when he got off the plane in his destination city, he would have immediate communication with his counterparts.

I would not be surprised to find out that all of the radios used nationwide have the same type of fleet/subfleet information in them. Careful analysis by the Grove Trunkcom newsgroup members will perhaps shed light on this theory.

Sharing Info on Trunked Systems

Along with the above trunking situation, it appears that the feds are using subfleets on their local government systems. In the area where I live, the City of West Palm Beach provides the major governmental trunking system to the county. Analysis of traffic on this system has revealed several additional local police departments using the system, as well as different government agencies. The local Drug Enforcement Administration (DEA) has been heard on the West Palm Beach system. A little birdie informs me that a couple of other federal agencies show up from time to time using their own subfleets.

The Office of the State Attorney here in Palm Beach County works very hush-hush investigations with various local governmental runs some joint operations with the feds. I had occasion to examine one of the special agent's vehicles the other day. You can guess what I found: a radio on the local sheriff's department, which they used for years but which have recently been noticeably absent, and an 800 MHz trunking radio on the West Palm Beach system.

Those of you who do not have trunk tracking radios are missing out on a new and exciting facet of federal monitoring. Those of you who do have the radios will have to start examining the talk groups you are receiving.

The federal government talk groups will not have as much activity on them as the local police or fire department. This is where good traffic analysis will pay off. (Did you think federal monitoring was just turning on a radio and listening?) Keep track of unusual talk groups. Keep track of little used talk groups. More information on this procedure will be found posted on the Trunkcom newsgroup available from the Grove internet server.

If you are not sure how to subscribe to Trunkcom or any of the other Grove radio forums, check in with the Grove website or send an e-mail to *majordomo@grove.net* with the word *help*. The system will automatically send you instructions on how to join and use this and other radio forums.

A Nice Piece of Equipment

If you have been following my column for a period of time, you will have noticed that I generally do not promote any particular piece of equipment. It is not my purpose in this column to tell you which piece of equipment to use. What works for me might not work for you and you might have equipment that I would never consider using. It all depends on what the operator is looking for in the equipment.

Every once in a while, though, something

comes along that I must have. Over the past year, however, I have acquired two such pieces of equipment that I'm so enthusiastic about, I am willing to preach about them to the unconverted. The first was the TrunkTracker—for obvious reasons. The second piece of equipment was the Optoelectronics Scout frequency counter. (*See this month's feature for more on how frequency counters work-ed*)

I noticed the Scout being used at the last couple of Grove Expos in Atlanta by some of the attendees. Everyone who was using one had nothing but good things to say about it. I kept putting off the purchase, but a few weeks ago I broke down and purchased one from Grove.

My scientific opinion? It is the neatest gadget I have owned in a long time. The Scout combines several advances in communication technology into one package. It is a handheld frequency counter, a frequency recorder, and an information management system all rolled up into a little package that you can literally slip into your pocket and forget.

The Scout stores up to 400 different frequencies with 255 hits on each frequency. It has a liquid crystal display and is easy to read and interpret. It will "Reaction Tune" several late model radios. I will not go into how or which radios it tunes, but all of the information is in the Optoelectronics display ad in *Monitoring Times*. You can also call the nice folks there at 800-327-5912 or check in with their Web site at **www.optoelectronics.com**. A call to Opto will help you with any questions.

The Scout Sniffs Out a New One

When I received my unit, I played around with it for several days until I had mastered its simple operation. I went to downtown West Palm Beach and did some monitoring. The local Federal building in our city is almost completely void of offices and communications equipment. It seems the government can get better rental rates by going out to local office buildings. This is true in my fair city, and it may be true in your city also. Check your local telephone directory and you will probably find a collection of federal agency offices in one location.

In my city it is in a bank building located along Lake Worth which provides a view of the Atlantic Ocean. Practically all of the government offices which use radios are located in this same building. The roof of the building has several antennas including the satellite dish used by the Secret Service. There is also a parking lot attached to the building. This is the same lot where the feds park their vehicles—they have a closed off area not accessible to the public.

On this morning I connected my Scout to a magnetic antenna mounted on the back deck of my car and drove downtown. Parking on the top deck of the lot, I left the unit running while I went off on my errands. A few hours later I drove home to examine what frequencies I had captured. I had all of the local Secret Service frequencies I normally hear plus a couple of the FBI repeaters on 167 MHz. I also received several hits on a frequency I did not recognize: 169.575 MHz.

This was a frequency I had not noticed before. Listening on the frequency did reveal traffic, although it was of the DVP/DES transmission. I have never heard the frequency in use in the clear mode. If it ever does, I will hopefully catch the subaudible tone.

... but I'm making an exception.

A check of the data base shows the frequency to be assigned to the Department of the Interior. I have a feeling this is not the case here. *(Editors note: 169.575 in South Florida is the input to the 164.525 FBI repeater in Andytown-Larry VH)*

Federal agencies are reallocating their frequencies more and more. For example, the main Customs frequency for intercept operations down my way is 164.775 MHz. This frequency is allocated to the Interior/Energy/Nuclear Emergency Search Team (it varies depending on the source you are checking and the age of the source). Here, it is not being used for anything other than Customs traffic. This is a frequency you might want to keep in your scanner if you live in or visit Florida.

We are already seeing a shift of federal frequencies. The frequencies used by Border Patrol/Immigration on 162/163 MHz have become void of traffic. All of the channels are being used in the simplex mode in the Miami area at the Krome Detention Center. The Border Patrol has gone up to the 170 MHz range with the new frequencies previously reported as 170.225 and 170.725 MHz. This might be true in your area also.

An Internet Intercept

One of my faithful contributors, Lokutus, of South Florida, was cruising the Internet a few days ago and checked into the DEA web site. After filtering through the normal DEA info, he discovered the area of the site which listed the contracts which had been awarded by DEA. One of these contracts was to a major name antenna manufacturer for "lookalike cell phone antennas." These are antennas which look like cell phone antennas but are electrically matched for different frequency ranges.

In this case the antennas are cut for the 418 MHz band but look like normal cellphone antennas. If you go back to the column a few months ago on the IRS Criminal Investigation Division, you will noticed I addressed the same situation.

It seems a lot of people are going to the cellphone antenna clones. Our local Sheriff's Department uses these antennas for their communications in their unmarked vehicles, but these are cut for the 155 MHz range. These antennas come in two types. The first type is the one that attaches to the glass. The second type is the one that attaches to the rear deck.

The lesson to be learned is this: All is not as it appears.

Jean Baker, KIN9DD

QSLing a Moving Target

Welcome aboard! Today we're going to talk about sending reception reports to airborne stations and look at some airline addresses.

You've just monitored a transmission from an airliner, and it's further away than any you have monitored before. Now you want to send a reception report to the pilot and, hopefully, he'll sign and send back your prepared verification card (see last month's column).

The same guidelines go for sending a reception report to a pilot as it does for a ground station: Just as we said last month, keep it short and simple. Do not mention the contents of the transmission directly. Make sure you write down the time of the transmission(s), and of course, use UTC time and include the date, the name of the airline, and the ground station it was working.

Now here comes the fun part — what do you use for an address for an airborne station? The simplest thing to do would be to send it to the destination airport of the flight, if you were fortunate enough to get it. If not, send it to the airline's home office. Write attn: "Captain," flight #, the name of the airline and the address.

It should read like this fictionalized address:

Attn: Captain
Flight #
Fagin Airlines
NibiNibi Airport
NibiNibi Island

Here again, remember to include return postage or an International Reply Coupon with your reception report. Now comes a very important part of the whole game — have lots of patience. You may luck out and get a verification on your first try, or it may take many tries before do. In either case, have fun in the attempt!

Where's my luggage? MT's editors wait at the Hartsfield baggage claim (Photo by Harry Baughn)

Below are some airline addresses to get you started. If you would like some more addresses, please drop me a line, c/o this column, with an SASE.

High-tech Solutions

- United Airlines has been testing a voice recognition system for taking airline reservations. Created using Applied Language Technologies' Speech Works 3.0 speech recognition software, the automated voice response system will be tested by United's 80,000 employees to make their own airline reservations.

  The intent is to improve current automated systems in which callers key in information using touchtone telephones, by providing a machine that can give voice recognition of what it was told. SpeechWorks 3.0 has a 50,000-word vocabulary and can understand sentences such as "I want to fly from Boston to San Francisco next Thursday in economy around four." The system will then be able to confirm the reservation.
- KLM Royal Dutch Airlines and IBM are joining forces in an attempt to improve airline baggage handling and security through better data management. KLM's Interactive Baggage Reconciliation System (IBRIS) will be integrated with IBM's Airport Wireless Infrastructure to provide instant data on baggage identification and location in a wireless, portable operation.

  IBRIS uses PC-based hand-held bar code scanners and operates in an IBM RS/6000 environment. KLM developed IBRIS with SHL Systemhouse in response to the ICAO's mandates for baggage reconciliation for security purposes. IBM will market the system in Europe, the Middle East and Africa. (It seems to me that our domestic airlines could use something like this!)
- United Airlines plans to experiment with a "one bag" carry-on luggage rule at Des Moines, Iowa. The carrier will limit leisure passengers on deep discount fares to a single carry-on bag. Travelers flying on more expensive and business fares will be allowed two.

  The test goal is to reduce the amount of carry-on luggage, which can slow boarding and sometimes presents safety problems. The rationale is that passengers flying on low-cost leisure fares likely would have to check in some bags and would be in less of a hurry to leave the destination airport.

  United has five flights from Des Moines to Chicago and five between Des Moines and Denver, each day. All use narrow-body equipment.

British Airways
Speedbird London
Superintendent Message
Control and Radio Operations
Headquarters
P.O. Box 10
Hounslow
Middlesex TW6 2JA
Great Britain

Deutsche Lufthansa (LH)
Abteilung Fernmeldedienst
D-6000 Frankfurt 75 Flughafen
Germany

Delta Airlines, Inc.
Hartsfield Atlanta
International Airport
Atlanta, GA 30320-6001

USAirways, Inc.
Executive Officer
Washington National Airport
Washington, DC 20001

Emirates Air
P.O. Box 686
Dubai, Emirates

Japan Airlines
Headquarters Tokyo
182 Marunouchi 2-chome
Chiyoda-ku
Tokyo 100 Japan

Cathay Pacific Airways
Swire House
9 Connaught Road Central
Hong Kong, Hong Kong

Air France
1, Square Max Hymans
F-75015 Paris
France

EgyptAir
6 Adly Street
Cairo, Egypt

Iceland/Flugleidir
Reykjavik Airport
15-121 Reykjavik
Iceland

Northwest Airlines, Inc.
Minneapolis\St. Paul
International Airport
St. Paul, MN 55111

Air New Zealand
Air New Zealand House
1 Queenstreet
Auckland 1 New Zealand

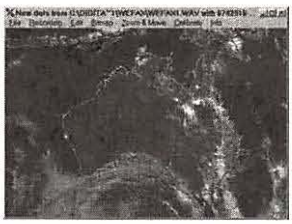
Korean Air
KAL Building
41-3 Seosomun-dong
Jung-gu
Seoul, Republic of Korea

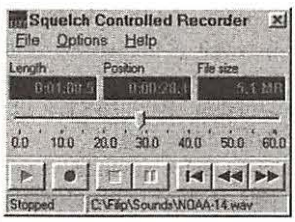
Hawaiian Airlines
P.O. Box 30008
Honolulu International Airport
Honolulu, HI 96820

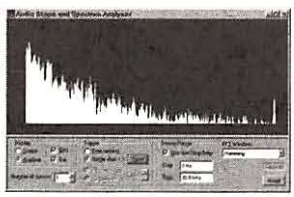
The world's most surprising communications receiver just got the world's most surprising add-on.

NEW

WiNRADiO®
Digital Suite™







The WiNRADiO Digital Suite represents a breakthrough in digital signal processing on a PC. It is a software option which expands your WiNRADiO with exciting digital signal decoding and processing facilities including:

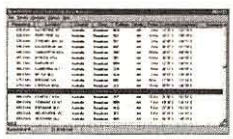
- Satellite Weather Fax (WEFAX)
- HF Fax
- Packet Radio
- Aircraft Addressing and Reporting System (ACARS)
- Digital Tone Multi-Frequency Signalling (DTMF)
- Continuous Tone Coded Squelch (CTCSS)
- Signal-Classified Scanning Control
- Audio Storage Oscilloscope
- Audio Spectrum Analyzer
- Squelch-controlled Audio Recorder and Playback

All that for $99!

Never before has such a comprehensive digital signal processing collection been made available at such a low cost and so elegantly integrated with a PC-based radio receiver.

The WiNRADiO card: plug it in and transform your PC.

The WiNRADiO software: enjoy the virtual control panel.



The optional WiNRADiO Database Manager

WiNRADiO Advantages

- WiNRADiO front-panel functions are more flexible and powerful than those of a traditional radio.
- WiNRADiO has practically unlimited memory capacity and can be customized for specialized applications.
- New functions, for example databases, can easily be integrated with WiNRADiO.
- A single PC can contain and control more than just one WiNRADiO.Observe activity on several bands simultaneously.
- The processing power of a PC can be used to process WiNRADiO signals, using a Sound Card.
- The new patented tuning feature of WiNRADiO called Visitune™ makes using a radio receiver a new and enjoyable experience.
- No cables and power supplies are needed to use WiNRADiO with your PC. Get rid of that clutter on your desk!
- Programmer's information is supplied for special applications development.
- Specially developed shielding materials and innovative design methods prevent PC-generated interference from entering the receiver.

For more information on WiNRADiO receivers and the WiNRADiO Digital Suite, contact our dealers or check out our Web site www.winradio.com

Dealers

USA

Advanced Digital Systems
St. Louis, MO
(314) 791-1206

Amateur Electronics Supply
Milwaukee, WI
(800) 558-0411

CB City
Westhaven, CT
(203) 932-3832

Electronic Distributors Corp.
Vienna, VA
(703) 938-8105

Grove Enterprises
Brasstown, NC
(800) 438-8155

Professional Wireless
Orlando, FL
(407) 240-2880

Radio City
Mounds View, MN
(800) 426-2891

Radioware
Westford, MA
(800) 950-9273

Scanners Unlimited
San Carlos, CA
(415) 573-1624

SSB Electronic USA
Mountaintop, PA
(717) 868-5643

The Communication Source
Arlington, TX
(800) 417-8630

The Ham Station
Evansville, IN
(800) 729-4373

Universal Amateur Radio
Reynoldsburg, OH
(800) 431-3939

Canada

Atlantic Ham Radio Ltd.
Downsview, ON
(416) 636-3636

APW Electronics
Chatham, ON
(519) 354-2285

Dealer enquiries invited.
info@winradio.com

WHAT'S NEW?

TELL THEM YOU SAW IT IN MONITORING TIMES

Going High-Tech

In line with our March focus on new technology, here are a few product announcements that put hi-tech tools to work for radio.

WiNRADiO Digital Suite

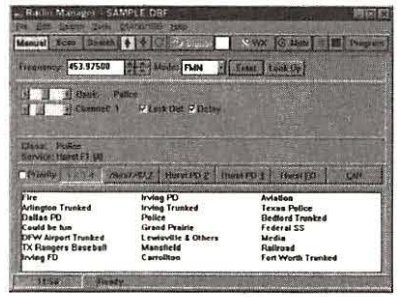
WiNRADiO, which, because of its popularity, has found its way into the pages of *MT* for several months running, has greatly expanded its abilities with the introduction of a new optional software package called Digital Suite. This digital signal processing module enables the receiver to process WEFAX (satellite weather fax), HF fax, packet radio (1200 baud FM AFSK and 300 baud FSK), aircraft addressing and reporting system (ACARS), digital tone multi-frequency signalling (DTMF), and continuous tone coded squelch system (CTCSS).

WEFAX screen of Digital Suite.

In addition, new screens provide a signal classifier, which allows you to select only the desired signal types in order to speed up scanning; audio oscilloscope for signals from dc to 20kHz; real-time spectrum analyzer; and squelch-controlled audio recorder and playback of ".wav" files.

System requirements are a Pentium PC running Windows 95 or NT 4, 16-bit SoundBlaster compatible sound card, and interconnect audio cable — plus the installed WiNRADiO and Digital Suite software, of course.

Digital Suite for WiNRADiO is available in the U.S. from Grove Enterprises, recently designated a WiNRADiO Super Dealer, for $99.95. Call 800-438-8155 for information. This may be the cheapest, most sophisticated digital demodulator on the market!



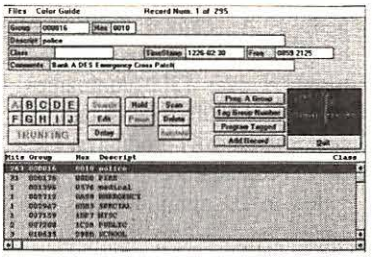
Radio Manager for Trunking

Ben Saladino has been a busy programmer this past year, coming out with two products to address the newest way to scan: following the trunking systems.

Saladino's Radio Manager for Windows already provided varying degrees of computer control for almost any scanner capable of computer connection using the OptoScan 456/535, Icom CI-V, or even a homebrew interface. Now, version 3.896 supports the Uniden BC896XLT Trunk-Tracker as well!

Features include virtual key pad, ID hit list, autologging IDs, show frequency for active ID, upload and download features

(can utilize DBF or text databases), filters, and custom-defined searches, and more. Version 3.896 is $40 from Ben Saladino, KC5IRJ, 660 West Oak, Hurst, TX 76053-5526. Visit his website at **www.interplaza.com/bensware/rm.htm** for all the details.



Another product—useful to anyone with a trunk tracking scanner, whether computer-controlled or not—is the Trunk Manager database program to help you store, sort, search, and print trunked radio system information. Trunk Manager stores most of its information in talkgroup files composed of channels representing radio talkgroups or channels. The files you create in Trunk Manager can, of course, be used to program the BC896XLT using Radio Manager. As shareware, Trunk Manager is a mere $15!

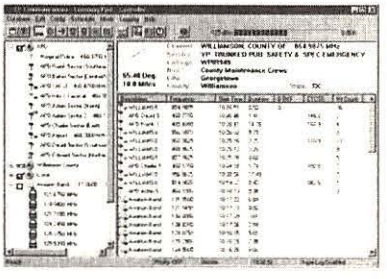
BC895XLT Added to ScanCat

Computer Aided Technologies has also added the BC895XLT TrunkTracker to the over 45 other radios supported their ScanCat Gold ver. 7.20. ScanCat can control all the conventional operations of the radio, plus permit you to selectively load the banks with trunking frequencies. All the usual import and export functions (using comma delimited "SDF" files) of conventional scanner control are available in trunk mode, except you will be scanning trunk groups instead. You can change banks or change talkgroups with the click of a mouse. Group numbers can be auto-logged as they become active, with number of hits and time stamp.

ScanCat Gold for Windows is $99.95 (or $159.95 for the "SE" surveillance enhanced version). The serial interface control cable for the BC895XLT is $29.95. These are available together or separately from Computer Aided Technologies (888-SCANCAT or visit **www.scancat.com**) and its dealers, including Grove Enterprises (800-438-8155 or visit Grove's web site at **www.grove.net**).

Listening Post

LP Communications was formed by a small number of computer professionals who are also scanning enthusiasts located in Austin, Texas. Having found other scanning programs lacking in two major areas—handling data and the user interface—they decided to write their own.



Listening Post operates out of a Windows environment, can record and play back sound files, draw from databases which use ODBC (Open DataBase Connectivity), and can be programmed to monitor or record activity unattended. The developers expect digital mode decoding to be added in the future.

Its multitasking ability means you can be performing other tasks while your system is scanning away; you can even play back audio files while the system is recording. Audio files are stored in the database so that it is possible to search for audio files using any criteria.

Requirements for the system include 486DX/100

or better computer with at least 16 Mb RAM, Windows 95, full duplex sound card, and a scanning receiver equipped with the Optoelectronics OS456 or OS535 interface (i.e., PRO-2004,5,6 series, PRO-2035 or 2042). Listening Post will create a database in Access database format if you do not have another database that you prefer to use.

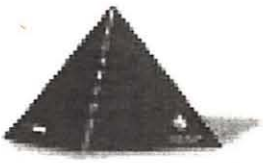
Listening Post software is $149.95. See their website at **www.lpcom.com** to order or write LP Communications, Inc., 5114 Balcones Woods Dr. Suite 307-305, Austin, TX 78759.

Paging Service for the Internet

There's a breaking-news service that's breaking into technology as well. AirMedia Inc garners your customized headline news, sports info, stock quotes, weather reports, as well as your personal or office e-mail messages and faxes. Through a wireless paging network, AirMedia alerts you when you have email or when news you have requested appears on the internet. One click can then open your browser or your e-mail connection to retrieve the information—There's no wasted log-ins only to find the information you seek has not arrived. You don't even have to be on your computer for AirMedia to listen for and accumulate your message alerts.

"AirMedia's Mobile Internet Antenna makes great sense for the mobile worker who wants to be kept up-to-date on important information while traveling from place to place," said J. Gerry Purdy, President and CEO of Mountain View, CA-based Mobile Insights, Inc. "The continuous information feed complements in-office Internet access by using narrowband paging to deliver valuable information from the Internet or a corporate intranet."

AirMedia Live software comes along with the pyramid-shaped Internet Antenna (around $99) or with the new Mobile Internet



Antenna (around $129). Actual connection costs $5.95 per month, or $9.95 with personal e-mail notification added. Rates vary for the mobile connection, which (like other paging services) is not available in all areas (It's not in Brasstown, for example). Check availability by entering your zip code at the AirMedia web page. Call 800-AIR-MEDIA or go to **www.airmedia.com** for more info.

Sony 7600 Upgrade

The compact Sony 7600G shortwave receiver has been upgraded to the 7600GS with the welcome addition of Sony's AC adapter and the AN-LP1 active shortwave antenna. In Larry Magne's January *MT* column, he pronounced this active antenna "better than anything else like it we've tested to date."

Best of all, these inclusions are offered at no increase in price! The 7600GS is still $249.95 at Grove and other shortwave dealers. Grove is also now offering Sony's active antenna as a separate purchase for $89.95 for use with other mid-priced receivers. Call 800-438-8155 for more information.

Electronic Engineers Master (EEM) Database (1998)

Available as four printed volumes as well as a CD-ROM, the EEM is regarded by design engineers as the premier directory of electronic components manufactured by over 5300 companies. More than 4000 pages of data are organized into 61 product categories. Technical details are provided in 20 miniglossaries and charts.

The four volume printed set is $99; the Windows CD-ROM is $115. Order from Mrie Botta, Hearst Business Communications/UTP Division, 645 Stewart Avenue, Garden City, NY 11530; ph. (516) 227-1314. For more information, visit the online site at **http://eemonline.com**.

HamCalc - Forget the Formulas!

HamCalc 31 is a FREE diskette with over 200 "painless math and design programs for radio amateurs and professionals." This service has been offered since 1933, and it a great boon to those of us who find mathematics tedious!

To get this free 3-1/2 inch 1.44 Mb MS-DOS/Windows diskette send US$5.00 check or money order (no stamps or IRCs please) to cover cost of materials and airmail anywhere in the world, to George Murphy VE3ERP, 77 McKenzie St., Orillia ON, L3V 6A6, Canada.

Help for DXers

Picking up on our author's advice in this month's "Informed DXer" article, here are some club resources for the mediumwave hobbyist.

The National Radio Club **Station Location Map Book 4th edition** is a broadcast band DXing reference which shows the location of all US and Canadian Stations (except TIS and Canadian LPRT's) on indexed maps. The 230-page, 4th edition edited by Bill Hale also includes the latitude and longitude coordinates of the station's transmitter location and a section of instructions authored by Dave Sundius enabling users to calculate distance and bearing to any station. Prices to the USA and Canada are: $12.00 to NRC/IRCA members or $17.95 to non-members. (Write for overseas airmail rates.) Send to National Radio Club Publications Center, P.O. Box 164, Mannsville, NY 13661-0164.

The International Radio Club of America **Mexican Log, 4th Edition**, lists all AM stations in Mexico by frequency, including call letters, state, city, day/night power, slogans, schedule in UTC, formats, networks and notes. The call letter index gives call, frequency, city and state. The city index (listed by state, then city) includes frequency, call and day/night power. This is an indispensable reference for anyone who hears Mexican radio stations. The price for members is $6.50 in North America, $7.50 South and Central America. Add $2 for non-members. Order from IRCA Bookstore, 9705 Mary NW, Seattle, WA 98117-2334.

Business News:

- Long-time radio retailer Electronic Equipment Bank (EEB) has closed its retail store and catalog division according to company president Dick Robinson. Reduced sales in the radio hobby market coupled with internal problems which have plagued the company apparently contributed in large part to the decision.

  A new corporation, Electronic Equipment Branch (EEBR) is bound to cause confusion. Run by the same personnel, it will offer products only to commercial and government sectors, not to the public.
- Sescom, Inc. has a number of products of interest to amateurs and experimenters, including aluminum enclosures and audio transformers. They now have a web page and online catalog at **www.sescom.com**.

Books and equipment for announcement or review should be sent to "What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Hwy 64 West, Brasstown, NC 28902 Press releases may be faxed to 704-837-2216 or e-mailed to mteditor@grove.net.

Ergo 3 Receiver Control Software

By Bob Parnass, AJ9S

Ergo is a shortwave receiver control program developed by Creative Express Corporation of Alberta, Canada. It runs under Microsoft Windows 95 or Windows NT, and requires a computer with an Intel Pentium CPU and a free serial port.

I helped "beta test" several prerelease versions before the current release, Ergo 3.0, release 1. I used a Japan Radio NRD-535D receiver with revision H firmware, though Ergo is designed to support the vanilla NRD-535, R. L. Drake R8A and R8B, the AOR AR7030, and the Watkins Johnson HF-1000 receivers as well.

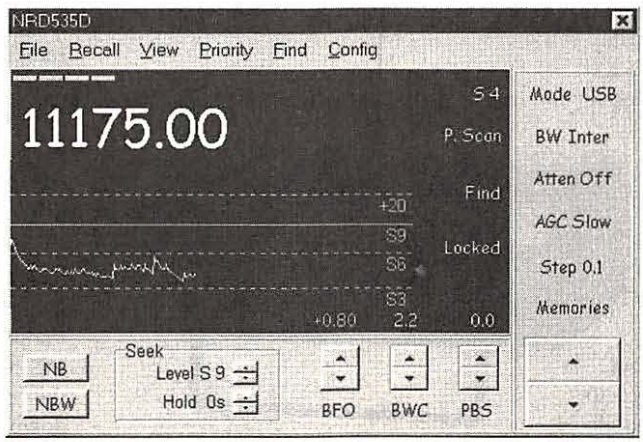


FIGURE 1: Ergo receiver control window, with both bar and signal scope type meters enabled.

The computer control capability of these receivers is different and is determined by the receiver manufacturer, not by Ergo. For example, Ergo 3.0 can control the squelch and volume when used with an AR7030 but not with an NRD535D, because Japan Radio provided no way to control squelch, volume, notch, nor tone via the computer interface.

Ergo does control the NRD-535D's control frequency, mode, filter, AGC, passband, noise blanker, and BFO through the receiver control window (fig. 1). Frequency adjustment is provided through adjustable step sizes and fine tuning. Hot keys are provided for main panel controls, so you can use either the mouse, the keyboard, or both — your choice. The receiver's operating parameters can be set using individual record data from the Klingenfuss Super Frequency List, though we didn't have one for testing.

You can create frequency databases of up to 500 records each and display the data in the "Main" window (fig. 2). Frequency databases are stored in proprietary format, but you can import and export data from ASCII text files. You can tune the receiver and set its mode by mouse clicking on a record. You can flag individual records for scanning. The database contains latitude/longitude fields for station location, and a "Map" window (fig. 3) shows a graphic representation of the signal path, provided you have entered the proper station coordinates.

Aside from the main database, you can read the operating parameters from the NRD's 200 memories into a "Quick Memories" window (fig 4) with one command and create alphanumeric labels. You can edit a memory channel's parameters, then instruct Ergo to write the changes for that one channel to the receiver. There's no way to read a disk file of 200 frequencies into Ergo and simply write it to the NRD's memories for later use.

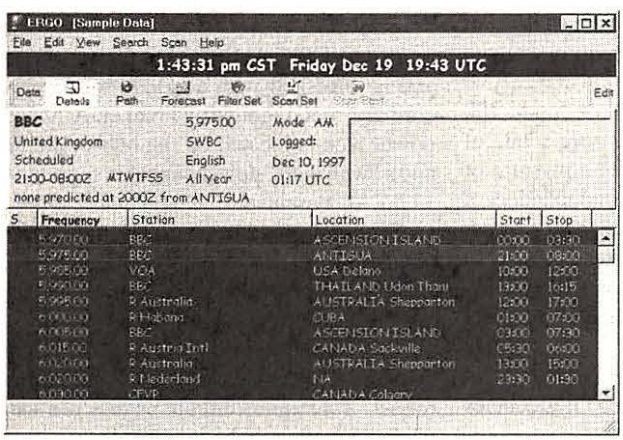
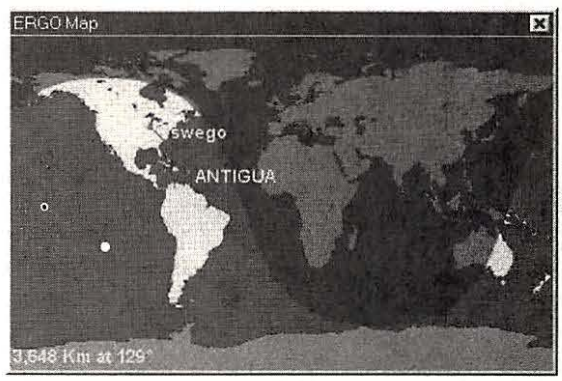
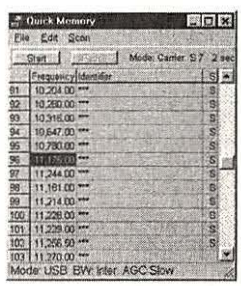


FIGURE 2: Ergo main window, with station database enabled.



Map display window uses database information.



Quick memories window lets you add labels and scan select flags to receiver memory data.

Summary

Ergo 3.0 provides a rich set of features sure to delight shortwave broadcast listeners. Utility listeners will find Ergo 3.0 useful, too. I'd like to see a future version include a way to bulk download frequencies from a disk file to the NRD-535D's memories and an option which exploits the computer sound card under program control.

For more information, contact Creative Express Corporation, P. O. Box 373, 16 Midlake Blvd. SE, Calgary, Alberta T2X 2X7, Canada or visit the Ergo web site at **http://calgary.shaw.wave.ca/~jfallows/Ergo_1.htm**.

Ergo 3.0 sells for $139 US directly from Creative Express or from Universal Radio (tel. 1-800-431-3939).

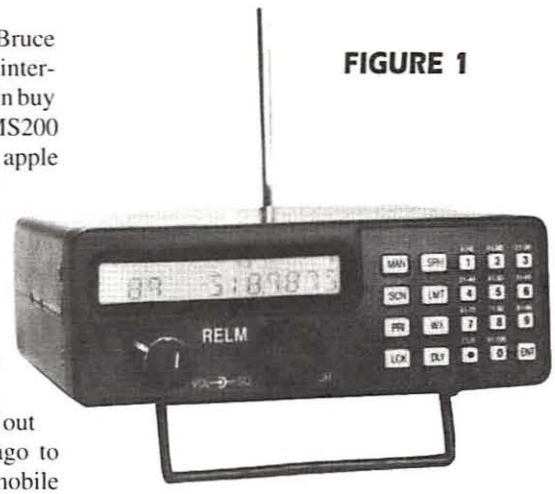
Bob Parnass, AJ9S

RELM MS200 Mobile/Base Scanner

Born in the USA. If you like Bruce Springstein's song, you'll be interested to know you can once again buy a scanner made in the USA. The RELM MS200 base/mobile model is as American as apple pie, and follows RELM's Japanese-made HS200 portable, reviewed in April 1997 *MT*.

As we wrote then, RELM Communications, formerly Regency Electronics, isn't new to the radio business. Regency and Electra were the dominant FM monitor manufacturers in the USA during the 1970s and 80s. Regency sold out its scanner line to Uniden 11 years ago to concentrate on building two-way land mobile radios, but reentered the scanner market last year.

FIGURE 1



The Basics

Both the MS200 and HS200 tune the conventional bands, including 800 MHz and civil aviation, but the portable HS200 covers Citizens Band as well (see measurements table). AM and NFM modes are automatically selected based on frequency and cannot be overridden. The aircraft band is covered in 25 kHz steps, versus 12.5 kHz steps found in other scanners. There's a hidden 6.25 kHz step size in the 136 - 174 MHz range. To use it in a search, your search limit must be a multiple of 6.25 kHz, e.g. 150.00625 MHz.

The 200 memory channels are divided into 10 banks. Channels can be locked out from the scan list or cleared. The first channel of each bank is a priority channel which can be checked every 2 seconds. You can access a channel directly through the keypad or scroll through the channels by twisting a top mounted selector knob.

The MS200 and HS200 key sequences follow in the tradition of older Regency programmables, like the M400. You program a memory channel by typing the frequency digits, then press Enter, then the channel number, followed again by Enter. You can stop there or use the keypad or selector knob to specify a CTCSS or DCS code. Pressing Enter stores the code in the current memory channel. You can program a 7 character alphanumeric label for each memory channel, too, using the rotary knob to scroll through a menu of characters, digits, and symbols.

A 2 second rescan delay can be enabled or disabled for all channels at the same time, not on a per-channel basis.

RELM claims a scan speed of "up to 100 channels/second," but we measure a rate of about 50 channels/second with a mixture of frequencies in different bands, independent of whether the tone decoding squelch is selected. Measuring the scan rate requires extra effort because the word SCAN appears on the display instead of a sequence of channel numbers or "rolling zeroes."

The MS200 supports one search bank with programmable limits. Up to 100 frequencies can be locked out during a search, but reprogramming either search limit erases the skip memories. When placed in search mode, the delay/hold key toggles between two settings: restart delay or search hold, which halts the search upon finding a signal. In the latter case, the channel selector knob can be used as a VFO tuning knob, although the MS200 contains no VFO, *per se*.

Computer Connection

You can connect an MS200 to a personal computer running Windows 3.1 or Windows 95, but you must furnish your own cable with a DB9P connector on one end and a DB9S on the other. The scanner comes with RELM's MSPCKit software on a floppy disk. We used the version 1.01 software to easily upload and download frequencies, labels, and tones. It does not permit real time control of scanning functions.

While there are no import or export commands, MSPCKit stores data in simple ASCII files. Each memory channel is represented by a line of comma delimited fields without quotation marks. Lines are terminated by both a return, a line feed, then a second return character. We were able to create a Microsoft Excel 97 spreadsheet, save it as a .csv file, rename it, then read it in using MSPCKit. We were also able to read a .scn file into Excel 97, though the extra return characters caused alternate empty rows.

The MSPCKit v1.01 text is not sized properly when we execute it under Windows95, using a screen size of 1024 by 768 pixels, 24 bit color, and large fonts. Column heading labels are truncated, though understandable.

Physical

The MS200 is labeled as a mobile scanner and is furnished with a fused mobile power cord and metal mounting bracket. A 12 VDC power jack is located on the rear of the case and a "wall wart" power supply is supplied for 117 VAC base use.

The electronics are housed in a thin, black plastic case with a bottom mounted speaker. A wobbly plastic tilt foot swings out from the bottom but lacks any detent, so it collapses easily when the scanner is pushed slightly forward. Internal construction is neat and robust. Two main circuit boards are sandwiched together and connect to a third board behind the front panel via two connectors, as shown in Figure 2.

MEASUREMENTS

RELM MS200, s/n 808 A0002640

Frequency coverage:
- 29 - 54 MHz (5 kHz steps)
- 118 - 136 MHz (25 kHz steps)
- 136 - 174 MHz (5 or 6.25 kHz steps)
- 406 - 520 MHz (12.5 kHz steps)
- 806 - 824.0375 MHz (12.5 kHz steps)
- 848.975 - 869.0375 MHz (12.5 kHz steps)
- 893.975 - 960 MHz (12.5 kHz steps)

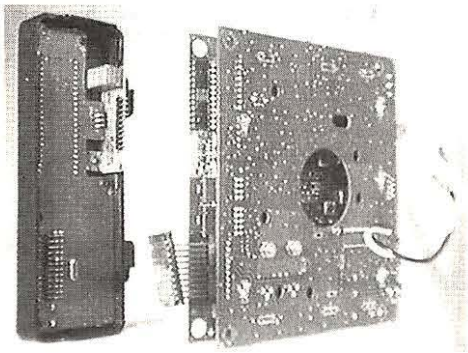
Modulation acceptance: 14 kHz
Intermediate Frequencies:
- 280, 0.450 MHz

Image rejection due to 1st IF:
- 61 dB @ 155 MHz
- 32 dB @ 500 MHz
- 37 dB @ 860 MHz

Audio output power:
- 2.2 W into 8 ohms
- @ 10% distortion

Practical scan speed: 50 channels/sec., CTCSS on or off
Search speed: 100 steps/sec.

FIGURE 2



RELM built the MS200 using a high quality BNC antenna jack. The inner contact has four fingers which grip the male pin. There are rear mounted 1/8" external speaker and tape out jacks, but the audio level at the tape jack varies with the setting of the volume control (Figure 3).

The old Regency M400 made a great mobile scanner due to its bright, vacuum fluorescent display and its well lit keypad. RELM built the modern MS200 with a backlit keyboard, too. Both keyboard and display are illuminated using green lamps, which remain dimly lit while the radio is on. The MS200 liquid crystal display contains most of the information you would expect in a scanner, but no S-meter. The low contrast display makes viewing difficult. The MS200 powers up doing the same task it was doing when last powered off: scanning, searching, or in manual mode.

The user manual did not specify the IFs (intermediate frequencies), so we deduced the IFs, similar to the HS200. The first IF is approximately 280 MHz and the last IF is 0.45 MHz. The high first IF and selective front end do a good job of rejecting images.

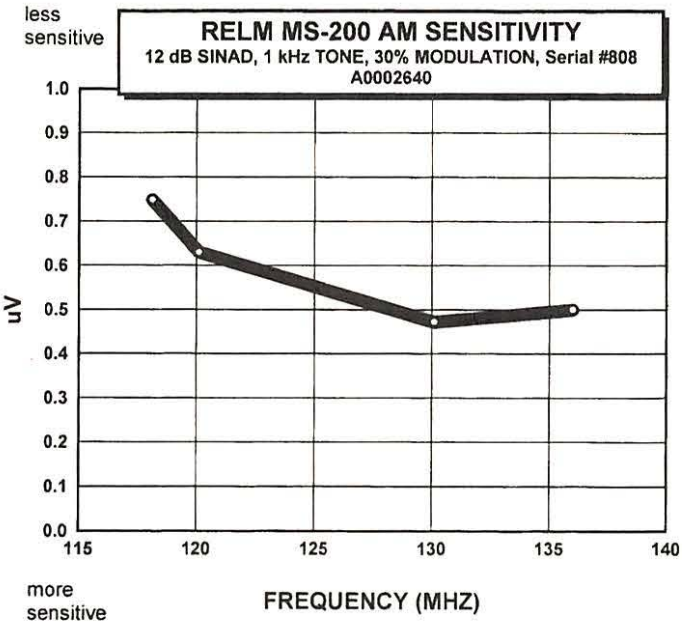
FIGURE 3

Too Sensitive?

We measured the sensitivity of our MS200 and found it sensitive on all bands, especially VHF-low and VHF-high bands. This comes at the expense of overload when we use our MS200 both mobile and at home with an Antenna Specialists AV-801 antenna mounted at about 17 feet high in a suburban/rural setting.

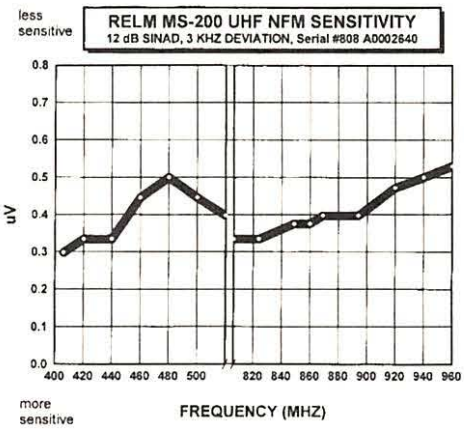
Paging interference pummels our MS200 on the VHF-high band, clobbering public safety and business frequencies alike. The 162.55 MHz weather transmitter is loud and clear on 161.65 MHz even though it's located 37 miles away. We experienced cellular phone interference on 857.4375 MHz while using our MS200 indoors with a 12" Austin Condor antenna.

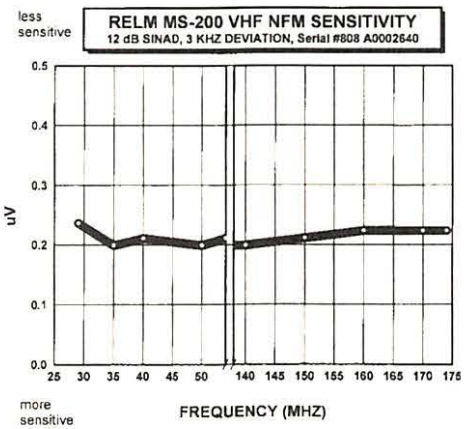
The audio output power is good, though the small internal speaker lacks the high frequency punch we require while using our MS200 in a noisy mobile environment. Adding an external Motorola speaker makes transmissions easier to understand.



Summary

The RELM MS200 has many assets for mobile scanning, such as a lighted keypad, alpha tags, and CTCSS/DCS squelch. Our MS200 could have been the best mobile scanner of the current crop if it weren't so sensitive to intermodulation interference and had a brighter display.





You are Not Alone! Check out our Club Lists!

To find other radio hobbyists, consult **http://www.grove.net/mtclubs.html** for a listing of radio clubs and nets worldwide, or send an SASE for free list (NA only) to Club Circuit, PO Box 98, Brasstown, NC 28902. No local club? Join a managed email list (see p. 2) for your area of interest.

For hamfests in your area, visit **http://www.arrl.org/hamfests.html** or call the ARRL at 860-594-0200.

Lawrence Magne
Editor-in-Chief, Passport to World Band Radio

International R-110

Just how *low* can you go?

MT readers are an elite group when it comes to shortwave listening goodies. We scour the shelves for the best in equipment, buy special publications and spend hours at the dials. For us, it may not be a case of "only the best will do," but at least it's, "only the best we can *afford* will do."

Yet, few of us will risk bringing a prized receiver along on vacation to Mexico or Jamaica—or even the local swimming spot. After all, there are just too many moderately priced portables that will do the trick nicely. But what if you travel abroad only infrequently, and want something rock-bottom cheap to keep in touch with breaking news or sports scores, or to tune in local stations that might be DX where you normally reside?

Cheapest of the cheap

Over the years, we've tested a number of receivers at *Passport to World Band Radio* that fit this bill nicely, and you may have seen our findings. But this month we have something of a near record-setter: a pocket portable, seemingly perfect for lightweight travel, that costs...$25.

Yes, that's $25 in the United States, not Singapore or Ouagadougou. And this is the everyday price, which includes shipment, taxes and the works unless you live in New Jersey, where the governor gets her cut. It is, quite simply, the cheapest of the cheap.

Strike out the band

Enter the Chinese-made International R-110, sized like a cigarette box and weighing only seven ounces with batteries. This three-band midget covers the AM band from 530-1600 kHz, FM in mono from 87.5-108 MHz and shortwave 7500-16000 kHz—all give or take. However, on our unit the upper limit of the AM band is barely 1600 kHz, so the entire expanded band from 1610-1700 kHz is omitted.

Of course, also omitted are the choice 60, 49 and 41 meter nighttime shortwave bands, among others. This alone rules out the R-110 for most who don't work nighttime shifts, but thanks to the rising sunspot cycle this shortcoming will be less serious as the coming years unfold.

International R-110

Features include safecracker tuning

Features are virtually nil. There an on-off/volume thumbwheel, a tuning thumbwheel, a short telescopic antenna which neither swivels nor rotates, an "MW/SW/FM" bandswitch, a one-LED signal-strength indicator of marginal value, a headphone socket, a small front-facing speaker and a coarse 1-1/4-inch analog dial with no bandspreading. Power is supplied by two "AA" cells.

Forget knowing what frequency the radio is tuned to. The dial is so cramped that you're fortunate to know what shortwave *band* you're tuning, much less the frequency. Readouts just don't get any worse than this.

Operation is predictable. With only the side of a small, knurled thumbwheel for tuning, and a tuning dial which covers over 8 MHz of the shortwave spectrum in just over one inch, you need the steady digit of a hemorrhoid surgeon and the patience of a Jesuit priest to tune in stations.

As if this weren't enough, the tuning process quickly wears down your thumb, as though you've dragged a carpenter's file across it. After a couple of hours of bandscanning, my thumb felt like it had been tromped on by Arnold Schwarzenegger's boot. In a dark moment, I wondered what it would be like to file for disability from Grove Enterprises.

Lousy sensitivity, dreadful audio

One saving grace of low-cost analog portables is that they tend to have better sensitivity to weak signals than do their comparably priced digital counterparts. But every rule has its exceptions, and the R-110 is clearly in this category. Sensitivity is not downright awful, but comes close. Clipping on a hank of wire to the antenna helps, as does judicious placement of the radio. But the bottom line is that the first requisite of any radio is to bring in signals, and here the R-110 is about as successful as Mr. Bean transporting a painting.

Selectivity, or adjacent-channel rejection, is mediocre, but typical of low-cost receivers. Ditto image rejection, but because the radio is so insensitive you don't actually hear many telltale sounds of image interference. Audio quality is strictly Alexander Graham Bell, and fatigues almost immediately.

Gift for Saddam Hussein

Who would buy such a thing? God only knows, but you can't help but think back to those customer-satisfaction surveys for cars which ask, "Yeah, you bought this model, but would you recommend it to a friend"?

So while some folks might purchase the R-110, few are likely to recommend this *chien de récepteur* to their friends. Unfortunately, to the extent that newcomers to world band radio purchase it, it's not only the radio, but probably shortwave listening in general that gets dissed.

But if you absolutely, positively can't resist having this tiny turkey in your collection, the International brand is available worldwide. One U.S. dealer is RGB Enterprises, P.O. Box 5367, Old Bridge, NJ 08857. Enclose a check or money order for $25, because at RGB they don't take American Express...or any other cards, for that matter.

Band-Aids for your thumb are extra.

Improvement to Lowe SRX-100 and Target HF3 Selectivity

Reader Greg Majewski informs us that he has devised an interesting modification for the Lowe SRX-100, which, as we reported recently, has just been discontinued. His modi-

fication also applies to the Target HF3, which is the same receiver, but unlike the Lowe is still in production. Both are manufactured by NASA Marine in England, (which by the way is unrelated to the NASA space agency in this country).

In our October review, the criticism is made that this receiver does not allow for the bandwidth to be selectable independent of mode. Additionally, that sole AM-mode bandwidth comes across as being rather wide because of its broad skirt selectivity. However, the receiver contains a narrower filter, originally designed for use for reception of single-sideband signals, and it is this which allows for an improvement.

Greg's suggested modification does not allow both filters to be selected for AM-mode reception. However, it does the next-best thing: It substitutes the narrower filter for the wider filter for AM-mode reception. Greg feels that the modification also provides the narrower filter with superior skirt selectivity by cascading it with the now-dormant "wide" filter.

Not having performed and tested this modification ourselves, we can't vouch for the result. But as a simple removal of one diode, it appears to be refreshingly straightforward and essentially reversible. This makes it mighty tempting as a quick fix. Here are Greg's instructions:

1. Remove the four screws on the sides just behind the front panel.
2. Remove the bottom cover by first sliding it back an inch, then lifting it off.
3. Remove the top cover back about half an inch, then up and back until you can see the speaker connection at socket SK7. Lift the speaker plug directly up from the socket, then remove the cover completely.
4. Locate diode D2, as printed on the circuit board, and with small wire cutters cut the end of the diode that is closer to the front panel. Bend the connected diode lead so the diode is up from the board and is not shorting to any other components. Also, make sure that the connected piece of the cut lead is not shorted to the circuit board ground which is around it.
5. Reassemble the covers and enjoy!

Questions? Greg may be reached at **gregmajewski@postoffice.worldnet.att.net,** or at 1176 Route 163, Oakdale, CT 06370.

Our thanks to Greg Majewski for sharing his findings!

This equipment review is performed independently by Lawrence Magne and his colleagues in accordance with the policies and procedures of International Broadcasting Services, Ltd. It is completely independent of the policies and procedures of Grove Enterprises, Inc., its advertisers and affiliated organizations.

John Catalano, PhD
j_catalano@conknet.com

Coast-To-Coast with the ICOM IC-PCR1000

Hopefully, in your part of the world, you are enjoying the refreshing weather that comes with equinox seasons by taking monitoring day trips. But, will you be enjoying the monitoring if you bring along an ICOM IC-PCR1000, "black-box" PC receiver that we looked at last time? Well, I've trudged through the last few weeks with the IC-PCR1000 and an IBM ThinkPad at my side to bring you this column. The pair and I have travelled coast-to-coast with lots of stops: So what is my opinion? Okay, you asked for it.

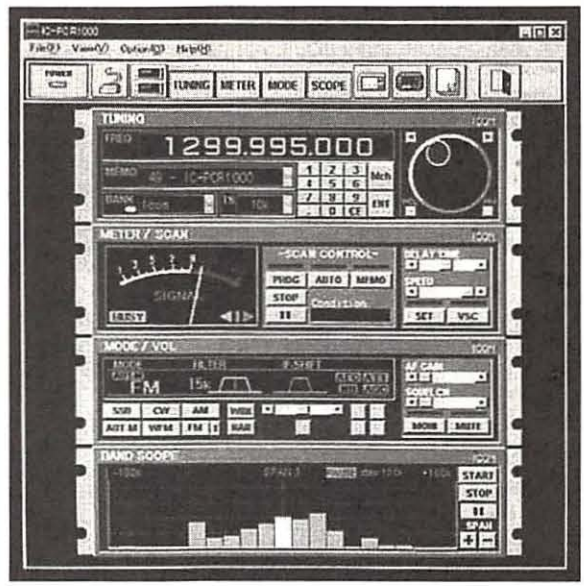
An IC-PCR1000 Refresher

Last time we looked at this very unique, wide band (0.01 to 1300 MHz) receiver from ICOM, which is totally controlled by a computer via a serial port cable. With the exception of an on/off switch, all controls are via the computer screen.

As we said last time, this is a surprisingly compact unit measuring approximately 8 inch x 5 inch x 1.2 inch thick. A serial cable, two 1.4M floppy disks, a power cube, whip antenna, and a thin 12-page instruction pamphlet complete the contents of the IC-PCR1000 package. Check last month's "Computers & Radio" column for full computer requirements, installation and software control options.

The fact that it is totally self-contained and not a plug-in expansion card allows it to be used with a laptop/notebook computer, thus giving the user more portable freedom. However, keep in mind that the IC-PCR1000 still requires power from either its plug-in supply, or 13.7 volts provided by another source. Therefore, it is not as portable as the notebook computer itself with its internal power supply.

As we discussed last time, the software allows the IC-PCR1000 to be controlled in three different ways. With my ICOM R-71 history, I felt most comfortable with the "communications receiver" screen, and used it for my treks. I did consider using the "rack mounted" component screen, but found that all four components would not fit on my notebook computer screen at the same time, requiring lots of dragging and minimizing to reach all functions.



For all the field monitoring I used the small telescoping whip antenna provided with the unit and an IBM 701C Thinkpad.

Please bear in mind that any review is simply one person's opinion, even if it is backed up with measurements. I cringe when I read self-appointed "experts" pontificating on this or the other. (You've heard the definition of an expert, haven't you? "Ex" is a has-been and a "spert" is a drip under pressure.) So this is simply one person's opinions and observations.

Hitting the Trail

The first stop was a hotel in western Vermont, almost within sight of an airport. To start, I tuned to the 6 MHz utility band where I was met with a cacophony of buzzes and whistles. Using the IC-PCR1000's spectrum scope I could see that they occurred at regular intervals throughout the lower part of the HF spectrum! Repositioning the antenna did not bring any better results. "Not a good start," I thought to myself.

Tuning around HF brought the same results to greater and lesser degrees. The time announcements by WWV were nowhere to be heard on any frequency. The ham bands could not be listened to without heavy interference. Only high power stations such as BBC and Radio Netherlands were listenable.

My first conclusion was that the IC-PCR1000 was being swamped by signals generated from neighboring rooms' televisions. So I stopped the listening session. With the help of a wake-up call from the front desk I was back at it at 4:00 a.m. Only the diehard insomniacs and crazy SWLers would be up at this time.

Surprisingly, the HF results were not much better. The VHF airport frequencies came in quite good, as did a few police and fire in the VHF range. But the airport was almost visible out my hotel window. It was was almost impossible to use the search feature in the VHF band due to the number of strong dead-air signals encountered.

In the 162 MHz band I was able to hear the local NOAA station which was less than 6 miles away. In frequencies above 220 MHz it seemed that these interfering signals decreased greatly in strength and number. In fact, in the search mode the IC-PCR1000 found the military airport information station (ATIS) in the 200-300 MHz band. After about three hours of monitoring I headed to my business appointment, disappointed with my monitoring efforts and tired.

A Pattern Develops In 'Vegas

That evening I went through the whole procedure again, with the same results. "So much for Vermont monitoring!" I thought as I boarded a plane for Las Vegas. It was about 1:30 a.m. when I entered my room in Las Vegas and went straight to the IC-PCR1000 (you can tell I have no use for gambling). "Now we'll see what this baby can do," I thought to my jet-lagged self.

To my great disappointment, the Vermont results repeated themselves: almost useless on HF except for the powerhouse stations, okay on low VHF, and better results at 200 MHz and above. Although VHF was usable, the number of stations did not come close to the number heard on my handheld scanner using a short rubber duck antenna.

Another Town: Another Try

Over the next few weeks I repeated the monitoring procedure in San Francisco, New York City suburbs, and Boston. The results, although with some slightly better HF reception, were the same. At each of these locations I removed the antenna to make sure the interfering "signals" were not internally generated by the IC-PCR1000's digital circuitry. The recurring, interfering signals disappeared when the antenna was removed, indicating that they were not internal digital circuit noise.

After my hectic travel schedule I retreated to the "quiet" mountains of New Hampshire and tried the same monitoring procedures with the IC-PCR1000. The HF spectrum still had pockets of interfering signals. However, there were some frequencies that were interference-free and allowed normal SWLing. These findings confirmed my suspicions. But now the VHF and above was dead! No NOAA weather, local police or aircraft. Only high powered paging signals were visible on the spectrum scope. What was going on?!

You Can Have Too Much

Perhaps the IC-PCR1000 is just too hot (sensitive) for its own good in the HF spectrum. The famous and ubiquitous Radio Shack Pro-200X line of scanners were wisely designed by Tandy to be on the low side of signal input sensitivity.

Why would a company design a radio with less sensitivity? Well, the answer runs counter to our "more-is-better" society. In a radio receiver, the introduction of strong input signals can cause internally generated secondary signals. A major cause of these unwanted signals is the result of multiple mixing products. The strong input signal cannot be easily "handled" by the mixer/converter and filter circuitry.

The result is "ghost" signals, usually with very low, or no modulation. If these are strong enough they can cause additional spurious signals. Then the receiver is totally useless. Sound familiar?

High end military radios are carefully designed to eliminate these spurious signals. It is these circuits and the associated filter circuits which define high-quality radios.

Tandy knew that their scanners would mostly be used in the high signal environments of cities. They adjusted their sensitivity down accordingly to minimize what are called spurious and intermods. The IC-PCR1000 seems to have problems in a high HF signal environment. This could be the reason that a short whip antenna was provided with the radio. But with TV local oscillators, microprocessor-controlled security systems and computer systems everywhere, a short indoor antenna is inviting strong digital signal pickup.

The HF Fix

Limiting the strength of input signals may have been ICOM's reason for a short indoor antenna, but what's controlling this radio? .... You got it, a computer.

Switching between an outdoor coaxially-fed tuned dipole and the supplied whip made a difference. The computer-generated noise was way, way down. Welcome back, shortwave! I listened to hams on 3.89 MHz sideband. RTTY signals around 6.95 MHz came through perfectly. The IC-PCR1000 became a truly listenable HF receiver.

Some pockets of interfering "signal-nests" still existed, making listening difficult on that band. The twenty meter ham band is one example. But, in general, attached to a tuned coaxially fed antenna, the IC-PCR1000 is a pleasure to use ... on HF. But the signals above 108 MHz were nowhere to be found using the HF tuned dipole.

VHF, Where Are You?

Remember that this last monitoring was taking place in the sparsely populated mountains. Here VHF signals are neither strong nor plentiful. However, my PRO-2006, using its radio-mounted whip, was pulling in one 162 MHz NOAA station. The IC-PCR1000, with its whip, heard nothing. The empirical conclusion was that the sensitivity of the IC-PCR1000 was very high in the HF range and low in the VHF/UHF range; at least lower than my PRO-2006.

Attaching my discone to the IC-PCR1000 brought four 162 MHz NOAA stations roaring in. Two meters was alive and commercial aircraft was heard. Life was good again.

My Gripes

I still find the scanning methodology and frequency storage and retrieval awkward and hard to use.

The VHF sensitivity could use a boost.

The spectrum scope is a great feature. However it is limited to +/- 200 kHz, which makes it of limited use above HF.

The need to stop the scope function when monitoring single side band (SSB) is very inconvenient.

Two antenna inputs should be provided: one for HF and the other for higher frequencies.

Last on my "wish it were better" list are IC-PCR1000's filters. Although there are a good number of them (four), they don't appear to be as sharp as those in my ICOM R-71. This is not so much a gripe as an observation.

Do I Like It?

Yes, but it's no R-71. However, the need for outdoor antennas for serious monitoring does not make the IC-PCR1000 the freely roaming receiver I thought it would be. However, if the user does not expect too much, the IC-PCR1000 does a very good job for $500. For the price you get a wide band scanner, a medium quality shortwave receiver, total computer control, and simple/easy external installation on any 486/Pentium computer. That's a lot.

Finally, with the exceptions previously noted, the software is visually pleasing, very useful and easy to use.

The ICOM IC-PCR1000 is available from Grove and other ICOM distributors listed on ICOM's website at:
http://www.icomamerica.com/.

Face-Off

How does it stack up against its competition, WinRadio's WR1000i PC card receiver? Good question, and one I have been working on for a while. But that's for next time.

LETTERS TO THE EDITOR

NEWS AND VIEWS FROM OUR READERS

Compiled by Rachel Baughn, Editor

Hi, Techs!

Our cover story and John Catalano's reports on the computer show (COMDEX; see Feb issue) and the consumer electronics show (CES) have thrown a momentary spotlight on technology and how we do things today.

Certainly computers have had a phenomenal impact on the way we listen to radios. The scanner and shortwave listener has never had such an array of choices in software control, auto logging, audio recording and playback, and importing and exporting of data.

Then there are the developments in "software" radios that operate out of your computer, such as the WiNRADiO and PCR1000. And finally, there are the e-mail hobby-related news groups where information is disseminated and exchanged in a matter of hours.

We applaud all these developments, but they do impact the role of the print media (as clubs devoted to the hobby know all too well). Publications have not been replaced, but they now must address both those who are "computerized" and those who are not. And meanwhile (as you are tired of hearing), costs keep going up, and second-class postage has risen yet again.

Monitoring Times has chosen to offset the costs by cutting its page count slightly. We know that faithful followers of the columns that have had to sacrifice will find these cuts upsetting. The solution is simple, though not necessarily easy: help us restore subscriptions and advertising to previous levels, and we'll be delighted to restore the pages!

How can you do that? Proselytize about radio to the kind of folks who are interested in world events or in local community politics; even call in prospective names and addresses to receive a sample issue.

If your local newsstand doesn't carry *Monitoring Times*, ask them why. Tell them to call 800-438-8155 and ask for Kelly or Judy. We will be happy to sell *MT* to them directly or to provide the names of our distributors.

If you have a favorite radio product, tell the company how delighted you are with their merchandise and they need to advertise in *Monitoring Times* to make it available to other hobbyists.

And lastly, keep on doing the wonderful work you have been by sending in newsclips, feedback, email and information to *MT* headquarters and the writing staff. You are our best resource, and even though all the material that comes in may not make it into print, your news keeps us abreast of the big picture and never goes to waste.

Now off my soapbox and on to your letters!

Construction Column

"In the Dec issue you indicate an ambivalence of continuing recently deceased Doug DeMaw's column. I am alarmed about this and consider it an important feature of *MT*, one I always read and look forward to reading. I urge you to find his replacement for us technically minded readers.

"My current interests are on the technical aspects of electronic communications, that currently being in the MW area. However, DeMaw's recent VHF article on 6 meters has me wanting to build the convertor it describes using an IC. I am encouraged by the upswing in sunspots and VHF activity.

"Over the years (in *QST* also) DeMaw had a gifted way of describing electronics. That is gone from us now; hopefully his tradition will continue in *MT*."

— Peter Barick, Sycamore, Illinois

Doug DeMaw was the best and is irreplaceable. However, to partially fill the void, Rich Arland's "KIS Radio" column will be increasing from quarterly to bi-monthly, alternating with "PCS Frontline." I encourage all would-be experimenters, or those with common equipment problems, to contact Rich and give him your feedback and suggestions of topics that you would find helpful. Send mail to *MT* headquarters or email *k7sz@juno.com — ed*

Nigerian Update

Hans Johnson has a few updates to his February article on Nigerian clandestines, which arrived after the issue went to press.

- Voice of Free Nigeria is now on 11645 kHz at 1900-2000 UTC Sat. Their new web address is **<http://www.FreeNigeria.org>** Email address is *PR@FreeNigeria.org*
- Radio Nadeco is also on 15685 2045-2100 Mon-Fri in addition to the 0600 broadcast.

At Least Mention Tesla

"I was reading the Nov 'Beginners Corner' and saw that myth #1 was 'Marconi invented radio.' I thought that maybe Nikola Tesla would finally get some of the credit he rightly deserved. However, he was not even mentioned in the whole article! The fact is that on June 21, 1943, the U.S. Supreme Court reversed an initial ruling to rule that Tesla had anticipated all other contenders with his fundamental radio patents. Unfortunately, most publications still cite Marconi as the main inventor of radio.

"I think the reason that Tesla is not given very much credit is that he never publicly demonstrated his patents. However, Marconi did — using many of Tesla's patents (and some of his own, too)."

— Aaron Mitchell

Bethany Towers Dismantled

"My trips to East Lansing from Lexington involves I-75 and take me past the Tylersville Road exit. Of course, I have to give a gander at Powel Crosley's shortwave antennae (WLW-O), and medium wave (WLW) one down the road. So, I was shocked to see no left tower, the center one on its side, and the right one (nearest Tylersville Road) still standing. The rhombics nearest I -75 were gone but one could still see the ones on the east side of the lot. (Please keep in mind, I was trying to pay attention to my driving on 24 Dec so I couldn't observe more closely than I did.)

"This prompts me to ask: Between Schenectady and Albany along I-90 is the hill where General Electric built the transmitters for WGY, WGFM, WRGB (1939 air date, very early for television), and WGEA. Is WGEA still standing? It was in 1972 when I drove past it last."

— Timothy Kuryla,
Kentucky Division of Water

According to a report in the Cleveland *Plain Dealer*, the two towers at Bethany were toppled Dec 2; the third is to be demolished later. The station was closed in 1994 when the VOA station consolidated its broadcasting efforts. Last October the General Services Administration recommended the site be used for a public golf course, recreation area, and learning center, leaving a portion to be sold for light industry.

When Crosley Broadcasting Corp. of Cincinnati originally built the Bethany relay station in 1944 it had 24 shortwave antennas and six transmitters. Columnist Doug Smith observed that "Before WW2, there was no VOA,

but several private broadcasters had shortwave operations. ... It looks like Bethany was the only one to survive the government takeover of U.S. SW broadcasting during the war." — *ed.*

Ham Club Dullsville

We applaud Scott Smith, who as program chairman of his ham radio club, asked what activities he could try "to add some life to our dull meetings?" Bob Grove sent this reply, worth sharing.

"It is difficult to stimulate people who just don't want to be stimulated. But here are a few ideas:

- Contact the schools to see if they would enjoy a demonstration on ham radio, then follow up with offers to do classes to help kids get their ham tickets.
- Offer your local community college to do ham radio classes for license preparation.
- Contact your local public safety organizations (police, sheriff, rescue, etc.) and offer to provide an emergency communications team.
- Put on ham radio demonstrations at fairs, malls, church events, and other public places, giving out literature from the ARRL on ham radio and inviting interested spectators to come to meetings.
- Participate in and publicize field day.
- Set up fox hunts (hidden transmitters).
- Arrange speakers from area technical businesses and institutions on interesting subjects.
- Start an interference committee to help resolve electrical noise problems for members and area residents.
- Contact the ARRL membership committee for suggestions as well.
- Arrange joint meetings or events with area scanner clubs, CB clubs or REACT teams, or SWL organizations; the libraries or local Radio Shack stores may help locate these.

"I hope these help. Good luck!" - *Bob W8JHD*

Compliments

We always enjoy getting compliments from our readers. This month I thought I would share just a few of them with the rest of you!

"I wish to compliment you and *Monitoring Times* for the article entitled 'Real World Radio' by Robert Felton, Jan 98 issue.

"This is one of the best and most relevant nontechnological articles I have read in any magazine, communications related or not. This should be required reading by every citizen who reads a newspaper, or watches television, or even listens to a radio. Bravo! Thank you."

— *Terry Jones, Plankinton, SD*

To Jacques d'Avignon: "I would like to compliment you for your fine monthly article ["Propagation Conditions"] in *Monitoring Times*. Having been a ham radio operator for over 30 years I've seen a couple of solar cycles come and go and have a real appreciation for accurate propagation prediction. "

— *From a West Coast ham*

To Jock Elliott: "Read your great FRS article in *Monitoring Times*. Keep up the great work!

"Instead of the 'Next CB,' I could see FRS as a great introduction for scouts and students to ham radio UHF operations! Ham radio does have its nearby 446 MHz 70cm allocations — and students who work 500mW FM DX across town might just be encouraged to take the simple Technician test, and work some 446 MHz FM DX!"

— *Bob Homuth, Phoeniz, AZ*

To Skip Arey: I really enjoy your column ["Beginner's Corner"] in *Monitoring Times*. In your June 1997 column, you talked about building a receiver and transmitter from the 1974 ARRL 'How to Become an Amateur Radio Operator.' My first homebrew project was a 'Genny' receiver from the 1968 version of this book. I first attempted to build it in 1973, but due to a lack of inspiration and no Elmers for a 3000 mile radius, it didn't get finished.

"I found a copy of the 1968 edition in Great Bend, Kansas, in 1995. I finally built the receiver in the spring of 1996 and never had a better feeling of accomplishment.

— *Rick Larkin KA0OXN*

Skip replied, "I keep getting after my friends at ARRL HQ to come up with a modern equivalent complete with project circuits. There are plenty of great ideas for this so I don't intend to let them off the hook."

Why wait for the ARRL? How about it, readers? Let's give our technically-inclined friends like Peter Barick and Rick Larkin some construction projects using today's modern components.

MT readers like to hear what other readers have to say. Send in *your* say to Rachel Baughn, Editor, P.O. Box 98, Brasstown, NC 28902 or email *mteditor@grove.net*

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JRC NRD 535D, $899; ICOM R7100, $999; Pro2006, $199; JRC external speaker, $50. Barely used, giving up hobby. All documentation and original boxes. 901-758-5748, email: rmchand@chistcom.net.

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CLOSING COMMENTS

By Bob Grove, Publisher

Internuts

A recent example of Internet irresponsibility leads to this month's topic. There is presently a widely-circulated—and totally erroneous—e-mail spam concerning a Federal Communications Commission (FCC) proposal to allow telephone companies to assess Internet service providers (ISPs) permanent access charges.

The fact of the matter is that, while the FCC did request public comment on such a proposal more than a year ago, the Commission denied the telcos' proposal and is not reconsidering. The proposal and its defeat were widely publicized last year, but seems to have been forgotten by the excitable Internet denizens.The current hoax is compounded by the fact that the reply date on the bogus release has been changed from the legitimate original (February 1997) to a fictitious one (February 1998).

Until recently, a similar hoax was resurrected every few years by fundamentalist groups asserting that the late Madeline Murray O'Hare, noted atheist, was trying to take religious broadcasters off the air. No such petition was ever requested by O'Hare; she merely suggested a moratorium on the concerted takeover of the 88.1-91.9 MHz FM spectrum by well-heeled religious broadcasters and sharing the spectrum with lesser-funded educational institutions as originally intended by the FCC.

So how do such "urban myths" and outright fabrications get started? Often it is merely a misunderstanding, passed on from inflamed reporter to gullible recipient. Remember when you played telephone? How close was the final message to the original after it got whispered a half dozen times along the line?

But there are other, more insidious, forces at work here as well. Not all of us are motivated by truth, integrity, and fair play. Because of some of life's cruelties, or even genetic predisposition, there is a significant number of individuals who feel the need to abuse, confound, control, or misinform. They do it to their familes, to their associates and, if they happen to have a computer, to the Internet.

To Regulate and How?

Considerable controversy revolves around Internet regulation. The issues are various: The telephone companies want to double-charge for the line tolls plus the time; the righteous right wants to tell us what we can and cannot say or show; law enforcement wants access to all encryption; profiteers want to spam everyone with promotional advertising; the list goes on and on.

Certainly, the Net is a surging behemoth, virtually uncontrolled, and some would say uncontrollable. This immediately arouses suspicion and fear in the minds of some, and suggests a path of unlimited opportunity for others. It is a delicate balancing act among free expression, marketing, and exploitation. Abuses are common.

Few of us would question that, while the vast majority of the Web goes from harmless to enormously useful, there are sites on the Web that are patently vulgar and offensive to the vast majority of visitors. Some of it is prurient ("sexploitation"), others racially or ethnically outrageous. Should they be banned, or is it their inalienable, Constitutionally guaranteed right of self expression?

Not all of us react identically to the same stimuli; what one person finds offensive, another might find ironically humorous, and yet another stimulating or satisfying; yet one more could be driven to anti-social behavior. It is easy to say, "Don't look at it," but that simplistic answer hasn't worked for the print media or TV programs. Just who shouldn't look at it? Minors? Baptists? Sadists? Sex offenders? Women? Everyone?

All forms of public communications are regulated to some degree. While I personally object to outside intrusion into and regulation of my life—and yours—I am pragmatic. I know that as soon as two people start talking, they discover that their philosophies on life and perspectives on relationships aren't identical. Not by a long shot. And the more people you talk with, the more varied the attitudes you will find.

But who is going to make the decision as to what is right and what is wrong, what is allowable and what is not? You? Me? The Righteous Right? The Libertine Left? Where is the middle ground? With such a complex issue, can there even be a middle ground?

Wouldn't it be a wonderful world if everyone had self control, if the Golden Rule were invoked in every transaction? But the facts of history tell us differently. This is both an exciting and frightening time in telecommunications. The information superhighway is paved with accelerating opportunity, but watch out for those speed bumps!

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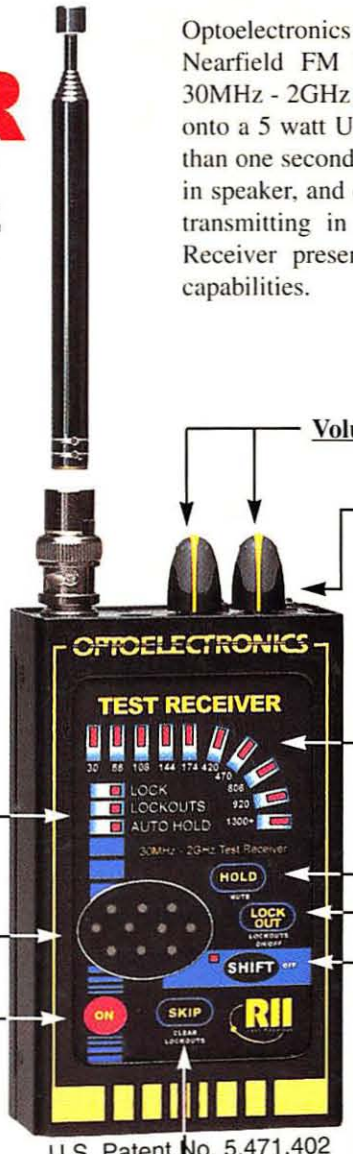

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